



THE NEW
IMPERIAL ENCYCLOPEDIA
AND
DICTIONARY

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KNOWLEDGE AND AN UN-
ABRIDGED DICTIONARY OF
THE ENGLISH LANGUAGE
UNDER ONE ALPHABET

RICHARD GLEASON GREENE, A.M., Editor-in-Chief
(Formerly Editor-in-Chief of the International Cyclopedia)

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SAN FRANCISCO
PACIFIC NEWSPAPER UNION

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<i>May 14, 1906</i>	
CLASS <i>ja</i>	XXC. No.
<i>143858</i>	
COPY B.	

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SCHEME OF SOUND SYMBOLS

FOR THE PRONUNCIATION OF WORDS.

Note.—(·) is the mark dividing words respelt phonetically into syllables; (ˈ), the accent indicating on which syllable or syllables the accent or stress of the voice is to be placed.

Sound-symbols employed in Respelling.	Representing the Sounds as exemplified in the Words.	Words respelt with Sound-symbols and Marks for Pronunciation.
ā	mate, fate, fail, aye	māt, fāt, fāl, ā.
ă	mat, fat	măt, făt.
â	far, calm, father	fâr, kâm, fâ'thēr.
ä	care, fair	câr, fâr.
aw	fall, laud, law	fawl, lawd, law.
ē	mete, mea ^t feet, free	mēt, mēt, fēt, frē.
ě	met, bed	mět, bět.
é	her, stir, heard, cur	hēr, stēr, hērd, kēr.
î	pine, ply, height	pîn, plî, hît.
ï	pin, nymph, ability	pïn, nïmf, ä-bîl'ï-tï.
ō	note, toll, soul	nôt, töl, söl.
ö	not, plot	nöt, plöt.
ô	move, smooth	môv, smôth.
ö	Goethe (similar to <i>e</i> in her)	gö'téh.
ow	noun, bough, cow	noun, bow, kow.
oy	boy, boil	boy, boyl.
û	pure, dew, few	pûr, dû, fû.
ÿ	bud, come, tough	büd, küm, tûf.
ú	full, push, good	fúl, pûsh, gúd.
ü	French plume, Scotch guid	plüm, güd.
ch	chair, match	chär, mäch.
ch	German buch, Heidelberg, Scotch loch (guttural)	bóch, hî'del-bērçh, löch.
g	game, go, gun	gām, gō, gŭn.
j	judge, gem, gin	jŭj, jēm, jĭn.
k	king, cat, cot, cut	kĭng, kăt, kōt, kŭt.
s	sit, scene, cell, city, cypress	sĭt, sēn, səl, sĭt'ĭ, sĭ'prēs.
sh	shun, ambition	shŭn, äm-bĭsh'ŭn.
th	thing, breath	thĭng, brēth.
th	though, breathe	thō, brēth.
z	zeal, maze, muse	zēl, māz, mŭz.
zh	azure, vision	äzh'ēr, vĭzh'ŭn.

ABBREVIATIONS USED IN THIS WORK.

a., or adj....adjective	A.U.C.....in the year of the building of the city (Rome)[<i>Annourbis conditæ</i>]
A.B.....Bachelor of Arts	Aug.....August
abbr.....abbreviation, abbrevi- ated	aug.....augmentative
abl. or abla.ablative	Aust.....Austrian
Abp.....Archbishop	A. V.....authorized version [of Bible, 1611]
abt.....about	avoir.....avoidsupois
Acad.....Academy	B.....Boron
acc. or ac..accusative	B.....Britannic
accom.....accommodated, ac- commodation	b.....born
act.....active	Ba.....Barium
A.D.....in the year of our Lord [<i>Anno Dom- ini</i>]	Bart.....Baronet
Adj. Adjutant	Bav.....Bavarian
Adm.....Admiral	bl.; bbl....barrel; barrels
adv. or ad.adverb	B.C.....before Christ
A. F.....Anglo-French	B.C.L.....Bachelor of Civil Law
Ag.....Silver [<i>Argentum</i>]	B.D.....Bachelor of Divinity
agri.....agriculture	bef.....before
A. L.....Anglo-Latin	Belg.....Belgic
Al.....Aluminium	Beng.....Bengali
Ala.....Alabama	Bi.....Bismuth
Alb.....Albanian	biog.....biography, biograph- ical
alg.....algebra	biol.....biology
A.M.....before noon [<i>ante meridiem</i>]	B.L.....Bachelor of Laws
A.M. Master of Arts	Bohem.....Bohemian
Am.....Amos	bot.....botany, botanical
Amer.....America, -n	Bp.....Bishop
anat.....anatomy, anatomical	Br.....Bromine
anc.....ancient, anciently	Braz.....Brazilian
AN. M. in the year of the world [<i>Anno Mun- di</i>]	Bret.....Breton
anon.....anonymous	Brig.....Brigadier
antiq.....antiquity, antiqui- ties	Brit.....British, Britannica
aor.....aorist, -ic	bro.....brother
app.....appendix	Bulg.....Bulgarian
appar.....apparently	bush.....bushel, bushels
Apr.....April	C.....Carbon
Ar.....Arabic	c.....century
arch.....architecture	Ca.....Calcium
archæol....archæology	Cal.....California
arith.....arithmetic	Camb.....Cambridge
Ark.....Arkansas	Can.....Canada
art.....article	Cant.....Canterbury
artil.....artillery	cap.....capital
AS.....Anglo-Saxon	Capt.....Captain
As.....Arsenic	Card.....Cardinal
Assoc.....Association	carp.....carpentry
asst.....assistant	Cath.....Catholic
astrol.....astrology	caus.....causative
astron... ..astronomy	cav.....cavalry
attrib.....attributive	Cd.....Cadmium
atty.....attorney	Ce.....Cerium
at. wt.....atomic weight	Celt.....Celtic
Au.....Gold [<i>Aurum</i>]	cent.....central
	cf.....compare [<i>confer</i>]
	ch or chh...church

ABBREVIATIONS.

Chal.....	Chaldee	diff.....	different, difference
chap.....	chapter	dim.....	diminutive
chem.....	chemistry, chemical	dist....	district
Chin.....	Chinese	distrib..	distributive
Chron.....	Chronicles	div.....	division
chron.....	chronology	doz.....	dozen
Cl.....	Chlorine	Dr.....	Doctor
Class.....	Classical [= Greek and Latin]	dr.....	dram, drams
Co.....	Cobalt	dram.....	dramatic
Co.....	Company	Dut. or D...	Dutch
co.....	county	dwt.....	pennyweight
cog.....	cognate [with]	dynam or	
Col.....	Colonel	dyn.....	dynamics
Col.....	Colossians	E.....	Erbium
Coll.....	College	E. or e.....	East, -ern, -ward
colloq.....	colloquial	E. or Eng.	English
Colo.....	Colorado	Eccl.....	Ecclesiastes
Com.....	Commodore	eccl. or	{ ecclesiastical [af
com.....	commerce, commer- cial	eccles....	{ fairs]
com.....	common	ed.....	edited, edition, edi- tor
comp.....	compare	e.g.....	for example [ex gratia]
comp.....	composition, com- pound	E. Ind. or	{ East Indies, East
compar....	comparative	E. I....	{ Indian
conch.....	conchology	elect.....	electricity
cong.....	congress	Emp..	Emperor
Congl.....	Congregational	Encyc.....	Encyclopedia
conj.....	conjunction	Eng. or E..	English
Conn or Ct.	Connecticut	engin.....	engineering
contr.....	contraction, con- tracted	entom ..	entomology
Cop.....	Coptic	env. ext....	envoy extraordinary
Cor.....	Corinthians	ep.....	epistle
Corn.....	Cornish	Eph.....	Ephesians
corr.....	corresponding	Episc.....	Episcopal
Cr.....	Chromium	eq. or =...	equal, equals
crystal....	crystallography	equiv.....	equivalent
Cs.....	Cæsium	esp.....	especially
ct.....	cent	Est.....	Esther
Ct. or Conn.	Connecticut	estab.....	established
Cu.....	Copper [<i>Cuprum</i>]	Esthon....	Esthonian
cwt.....	a hundred weight	etc.....	and others like [et cetera]
Cyc.....	Cyclopedia	Eth.....	Ethiopic
D.....	Didymium	ethnog....	ethnography
D. or Dut..	Dutch	ethuol.....	ethnology
d.....	died	et seq.....	and the following [et sequentia]
d. [l. s. d.]	penny, pence	etym.....	etymology
Dan.....	Daniel	Eur.....	European
Dan.....	Danish	Ex.....	Exodus
dat.....	dative	exclam ..	exclamation
dau.....	daughter	Ezek.....	Ezekiel
D. C.....	District of Columbia	Ezr.....	Ezra
D.C.L.....	Doctor of Civil [or Common] Law	F.....	Fluorine
D.D.....	Doctor of Divinity	F. or Fahr.	Fahrenheit
Dec.....	December	f. or fem...	feminine
dec.....	declension	F. or Fr....	French
def.....	definite, definition	fa.....	father
deg.....	degree, degrees	Fahr. or F.	Fahrenheit
Del.....	Delaware	far.....	farriery
del.....	delegate, delegates	Fe.....	Iron [<i>Ferrum</i>]
dem.....	democratic	Feb.....	February
dep.....	deputy	fem or f..	feminine
dep.....	deponent	fig.....	figure, figuratively
dept.....	department	Fin.....	Finnish
deriv.....	derivation, deriva- tive	F.—L.....	French from Latin
Deut.....	Deuteronomy	Fla.....	Florida
dial.....	dialect, dialectal	Flem....	Flemish
diam....	diameter	for.....	foreign
Dic.....	Dictionary	fort.....	fortification
		Fr. or F....	French
		fr.....	from

ABBREVIATIONS.

freq.....frequentative	ind.....indicative
Fris.....Frisian	indef.....indefinite
ft.....foot, feet	Indo-Eur...Indo-European
fut.....future	inf.....infantry
G. or Ger...German	inf or infin.infinite
G.....Glucinium	instr.....instrument, -al
Ga.....Gallium	int... ..interest
Ga.....Georgia	intens.....intensive
Gael.....Gaelic	interj. or
Gal.....Galatians	int.....interjection
gal.....gallon	interrog....interrogative pro-
galv.....galvanism, galvanic	noun
gard.....gardening	intr. or
gen.....gender	intrans...intransitive
Gen.....General	Io... ..Iowa
Gen.....Genesis	Ir.....Iridium
gen.....genitive	Ir.....Irish
Geno.....Genoese	Iran.....Iranian
geog.....geography	irr.....irregular, -ly
geol.....geology	Is.....Isaiah
geom.....geometry	It.....Italian
Ger.....German, Germany	Jan.....January
Goth.....Gothic	Jap.....Japanese
Gov.....Governor	Jas.....James
govt.....government	Jer.....Jeremiah
Gr.....Grand, Great	Jn.....John
Gr.....Greek	Josh.....Joshua
gr.....grain, grains	Jr.....Junior
gram.....grammar	Judg.....Judges
Gr. Brit....Great Britain	K.....Potassium [<i>Kalium</i>]
Gris.....Grisons	K.....Kings [in Bible]
gun.....gunnery	K.....king
H.....Hegira	Kan.....Kansas
H.....Hydrogen	Kt.....Knight
h.....hour, hours	Ky.....Kentucky
Hab.....Habakkuk	L.....Latin
Hag.....Haggai	L.....Lithium
H. B. M....His [or Her] Britan-	l. [l. s. d.], } pound; pounds
nic Majesty	or £..... } [sterling]
Heb.....Hebrew, Hebrews	La.....Lanthanum
her.....heraldry	La.....Louisiana
herpet.....herpetology	Lam.....Lamentations
Hg.....Mercury [<i>Hydrar-</i>	Lang.....Languedoc
<i>gyrum</i>]	lang... ..language
hhd.....hogshead, hogsheads	Lap.....Lapland
Hind.....Hindustani, Hindu,	lat.....latitude
or Hindi	lb.; llb. or } pound; pounds
hist.....history, historical	lbs..... } [weight]
Hon.....Honorable	Let.....Lettish
hort.....horticulture	Lev.....Leviticus
Hos.....Hosea	LG.....Low German
Hung.....Hungarian	L.H.D.....Doctor of Polite Lit-
Hydros....Hydrostatics	erature
I.....Iodine	Lieut.....Lieutenant
I.; Is.....Island; Islands	Lim.....Limousin
Icel.....Icelandic	Lin.....Linnæus, Linnæan
ichth.....ichthyology	lit.....literal, -ly
Ida.....Idaho	lit.....literature
i.e.....that is [<i>id est</i>]	Lith.....Lithuanian
Ill.....Illinois	lithog.....lithograph, -y
illus.....illustration	LL.....Late Latin, Low
impera or	Latin
impr.....imperative	LL.D.....Doctor of Laws
impers.....impersonal	long.....longitude
imp for imp.imperfect	Luth.....Lutheran
impf. p. or	M.....Middle
imp.....imperfect participle	M.....Monsieur
improp.....improperly	m.....mile, miles
In.....Indium	m. or masc.masculine
in... ..inch, inches	M.A.....Master of Arts
incept.....inceptive	Macc. Maccabees
Ind.....India, Indian	mach... ..machinery
Ind.....Indiana	Mag.....Magazine

ABBREVIATIONS.

Maj.....Major	N. A., or
Mal.....Malachi	N. Amer.North America, -n
Mal.....Malay, Malayan	nat.....natural
manuf....manufacturing,	naut.....nautical
manufacturers	nav.....navigation, naval af-
Mar.....March	fairs
masc or m.masculine	Nb.....Niobium
Mass.....Massachusetts	N. C. or
math.....mathematics, math-	N. Car...North Carolina
ematical	N. D.....North Dakota
Matt.....Matthew	Neb.....Nebraska
M.D.....Doctor of Medicine	neg.....negative
MD.....Middle Dutch	Neh.....Nehemiah
Md.....Maryland	N. Eng....New England
ME.....Middle English, or	neut or n...neuter
Old English	Nev.....Nevada
Me.....Maine	N.Gr.....New Greek, Modern
mech.....mechanics, mechani-	Greek
cal	N. H.....New Hampshire
med.....medicine, medical	NHG.....New High German
mem.....member	[German]
mensur...mensuration	Ni ... Nickel
Messrs. or	N. J.....New Jersey
MM.....Gentlemen, Sirs	NL.....New Latin, Modern
metal.....metallurgy	Latin
metaph...metaphysics, meta-	N. Mex....New Mexico
physical	N. T.. or
meteor....meteorology	N. Test...New Testament
Meth.....Methodist	N. Y.....New York [State]
Mex.....Mexican	nom.....nominative
Mg.....Magnesium	Norm. F...Norman French
M.Gr.....Middle Greek	North. E...Northern English
MHG.....Middle High Ger-	Norw....Norwegian, Norse
man	Nov.....November
Mic.....Micah	Num.....Numbers
Mich.....Michigan	numis....numismatics
mid.....middle [voice]	O.....Ohio
Milan.....Milanese	O.....Old
mid. L. or } Middle Latin, Me-	O.....Oxygen
ML..... } diæval Latin	Obad.....Obadiah
milit. or	obj.....objective
mil....military [affairs]	obs. or †...obsolete
min.....minute, minutes	obsoles....obsolescent
mineral...mineralogy	O.Bulg....Old Bulgarian or Old
Minn.....Minnesota	Slavic
Min. Plen..Minister Plenipoten-	Oct.....October
tiary	Odontog...odontography
Miss.....Mississippi	OE.....Old English
ML. or } Middle Latin, Me-	OF or
mid. L... } diæval Latin	O. Fr....Old French
MLG.....Middle Low German.	OHG.....Old High German
Mlle.....Mademoiselle	Ont.....Ontario
Mme.....Madam	opt...optics, optical
Mn.....Manganese	Or.....Oregon
Mo.....Missouri	ord.....order
Mo.....Molybdenum	ord....ordnance
mod.....modern	org.....organic
Mont.....Montana	orig.....original, -ly
Mr.....Master [Mister]	ornith....ornithology
Mrs.....Mistress [Missis]	Os.....Osmium
MS.; MSS.manuscript; manu-	OS.....Old Saxon
scripts	O. T., or
Mt.....Mount, mountain	O. Test...Old Testament
mus.....music	Oxf.....Oxford
MUS.DOC...Doctor of Music	oz.....ounce, ounces
myth.....mythology, mytho-	P.....Phosphorus
logical	p.; pp....page; pages
N.....Nitrogen	p., or part..participle
N. or n....North, -ern, -ward	Pa. or Penn.Pennsylvania
n.....noun	paint.....painting
n or neut...neuter	palæon....palæontology
Na.....Sodium [Natrium]	parl.....parliament
Nah.....Nahum	pass.....passive

ABBREVIATIONS.

pathol or	pt.....	past tense
path.....	pt.....	pint
Pb.....	Pt.....	Platinum
Pd.....	pub.....	published, publisher,
Penn or Pa.		publication
Pennsylvania	pwt.....	pennyweight
perf.....	Q.....	Quebec
perh.....	qt.....	quart
Pers.....	qtr.....	quarter [weight]
Persic	qu.....	query
pers.....	q.v.....	which see [quod
persp.....		vide]
pert.....	R.....	Rhodium
Pet.....	R.....	River
Peter	Rb.....	Rubidium
Pg. or Port.	R. Cath....	Roman Catholic
Portuguese	rec. sec....	recording secretary
phar.....	Ref.....	Reformed
pharmacy	refl.....	reflex
PH.D.....	reg.....	regular, -ly
Doctor of Philoso-	regt.....	regiment
phy	rel. pro. or	
Phen.....	rel.....	relative pronoun
Phenician	repr.....	representing
Phil.....	repub.....	republican
Philippians	Rev ..	Revelation
Philem.....	Rev.....	The Reverend
Philemon	Rev. V.....	Revised Version
philol.....	rhet.....	rhetoric, -al
philology, philologi-	R. I.....	Rhode Island
cal	R. N.....	Royal Navy
philos. {	Rom.....	Roman, Romans
philosophy, philo-	Rom.....	Romanic or Ro-
or phil... {		inance
sophical	Rom. Cath. {	Roman Catholic
phonog.....	Ch. or R. {	Church
phonography	C. Ch.... {	
photog.....	r.r.....	railroad
photography	Rt. Rev ..	Right Reverend
phren.....	Ru.....	Ruthenium
phrenology	Russ.....	Russian
phys.....	r.w.....	railway
physics, physical	S.....	Saxon
physiol....	S.....	Sulphur
physiology, physi-	s.....	second, seconds
ological	s. [l. s. d.]..	shilling, shillings
Pied.....	S. or s.....	South, -ern, -ward
Piedmontese	S. A. or	
Pl.....	S. Amer..	South America, -n
Plate	Sam.....	Samaritan
pl. or plu...plural	Sam.....	Samuel
Pl. D.....	Sans, or	
Platt Deutsch	Skr.....	Sanskrit
plupf.....	Sb.....	Antimony [Stibium]
pluperfect	s.c.....	understand, supply,
P.M.....		namely [scilicet]
afternoon[post meri-	S. C. or	
diem]	S. Car....	South Carolina
pneum.....	Scand.....	Scandinavian
pneumatics	Scot.....	Scotland, Scotch
P. O.....	scr.....	scruple, scruples
Post-office	Scrip.....	Scripture [s], Scrip-
poet.....		tural
poetical	sculp.....	sculpture
Pol.....	S. D.....	South Dakota
Polish	Se.....	Selenium
pol. econ...	sec....	secretary
political economy	sec.....	section
polit.....	Sem.....	Semitic
politics, political	Sep.....	September
pop....	Serv.....	Servian
population	Shaks.....	Shakespeare
Port. or Pg.	Si.....	Silicon
Portuguese		
poss.....		
possessive		
pp.....		
pages		
pp.....		
past participle, per-		
fect participle		
p. pr.....		
present participle		
Pr. or Prov.		
Provengal		
pref.....		
prefix		
prep....		
preposition		
Pres.....		
President		
pres.....		
present		
Presb.....		
Presbyterian		
pret.....		
preterit		
prim.....		
primitive		
priv.....		
privative		
prob.....		
probably, probable		
Prof.....		
Professor		
pron.....		
pronoun		
pron.....		
pronunciation, pro-		
nounced		
prop.....		
properly		
pros.....		
prosody		
Prot..		
Protestant		
Prov. or Pr.		
Provengal		
Prov.....		
Proverbs		
prov.....		
province, provincial		
Prov. Eng.		
Provincial English		
Prus.....		
Prussia, -n		
Ps.....		
Psalm, Psalms		
psychol....		
psychology		

ABBREVIATIONS.

Sic.....	Sicilian	trigon.....	trigonometry
sing.....	singular	Turk.....	Turkish
sis.....	sister	typog.....	typography, typographical
Skr. or		U.....	Uranium
Sans.....	Sanskrit	ult.....	ultimate, -ly
Slav.....	Slavonic, Slavic	Unit.....	Unitarian
Sn.....	Tin [<i>Stannum</i>]	Univ.....	Universalist
Soc.....	Society	Univ.....	University
Song Sol...	Song of Solomon	U. Presb...	United Presbyterian
Sp.....	Spanish	U. S... ..	United States
sp. gr.....	specific gravity	U. S. A....	United States Army
sq.....	square	U. S. N....	United States Navy
Sr.....	Senior	Ut.....	Utah
Sr.....	Strontium	V.....	Vanadium
St.: Ste....	Saint	v.....	verb
St.	street	Va.....	Virginia
stat.....	statute	var.....	variant [word]
S.T.D.....	Doctor of Sacred Theology	var.....	variety of [species]
subj.....	subjunctive	Ven.....	Venerable
suf.....	suffix	Venet.....	Venetian
Su. Goth...	Suo-Gothic	vet.	veterinary
superl.....	superlative	v. i. or	
Supp.....	Supplement	v. intr....	verb intransitive
Supt.....	Superintendent	vil.....	village
surg.....	surgery, surgical	viz.....	namely, to-wit [<i>vide-licet</i>]
Surv.....	surveying	v. n.....	verb neuter
Sw.....	Swedish	voc.....	vocative
Swab.....	Swabian	vol.....	volume
sym.....	symbol	vols.....	volunteers
syn.....	synonym, -y	Vt.....	Vermont
Syr.....	Syriac, Syrian	v. tr.....	verb transitive
t.....	town	W.....	Tungsten [<i>Wolfram</i>]
Ta... ..	Tantalum	W.	Welsh
Tart.....	Tartar	W. or w....	West, -ern, -ward
Te.....	Tellurium	Wal.....	Walachian
technol....	technology	Wall.....	Walloon
teleg.....	telegraphy	Wash.....	Washington
Tenn.....	Tennessee	Westph....	Westphalia, -n
term.....	termination	W. Ind. . .	West Indies, West
terr.....	territory	or W. I... }	Indian
Teut.....	Teutonic	Wis.....	Wisconsin
Tex.....	Texas	wt.....	weight
Th.....	Thorium	W. Va.....	West Virginia
theat.....	theatrical	Wyo.....	Wyoming
theol.....	theology, theological	Y.....	Yttrium
therap.....	therapeutics	yd.....	yard
Thess.....	Thessalonians	yr.....	year
Ti.....	Titanium	Zech.....	Zechariah
Tim.....	Timothy	Zeph.....	Zephaniah
Tit.....	Titus	Zn.....	Zinc
Tl.....	Thallium	zool.....	zoology, zoological
toxicol....	toxicology	Zr.....	Zirconium
tp.....	township		
tr. or trans.	transitive		
transl.....	translation, trans, later		

See also ABBREVIATIONS: in Vol. I

IMPERIAL ENCYCLOPEDIA AND DICTIONARY.

AS'CALON, or **ASH'KELON**: ruined city of Palestine, on the shore of the Mediterranean, 36 m. w.s.w. of Jerusalem. Its name occurs often in the Old Testament. It was in ancient times a fortified city, and the principal town of one of the five lordships of the Philistines. Herod the Great embellished it with baths, palaces, and fountains; but it suffered in the wars with the Romans. There was a celebrated temple of Derketo, the Venus of the Syrians, at A. After continuing long under the dominion of the Roman empire, the city came into the possession of the Saracens in the 7th c. In 1099, a great battle was fought on the plains of A., between the Crusaders and Saracens, when the Christians gained a decisive victory. The city, however, a number of years after, was recaptured by the Moslems, and held by them as a strongly fortified place until 1153, when it was taken by the Crusaders under Baldwin III. In 1187, it was retaken by the Saracens, but afterwards (1192) fell into the hands of Richard Cœur de Lion. Subsequently, being more than once dismantled and repaired during the wars between Richard and Saladin, it was reduced to desolation by Sultan Bibars in 1270.

The ruins of this ancient city occupy an extensive semi-circular eminence, sloping gently to the e., but abrupt and steep towards the sea. Part of the walls are still standing, with the remains of Gothic churches, a palace, and several edifices of more ancient date, which attract the notice of the traveller and the antiquary.

ASCANIUS, *ās-kā'nī-ūs*, also called **IULUS**: according to Virgil and Livy, the son of Æneas and Creusa, and founder of Alba Longa. One tradition says he succeeded his father as king of the Latins. The Julia gens of Rome claimed him as an ancestor.

ASCAPART, *ās'kā-pārt*: a giant 30 ft. high, said to have been conquered by Sir Bevis of Hampton, whom with his wife and horse, A. carried under his arm. He is represented on the city gates of Southampton, Eng. Shakespeare, Pope, and others allude to him.

ASCARIDES, n. plu. *ās-kār'ī-dēz*, sing. **As'CARIS** [Gr. *askāris*, a long round worm in the bowels]: the small intestinal thread-worms. See **ASCARIS**.

ASCARIS.

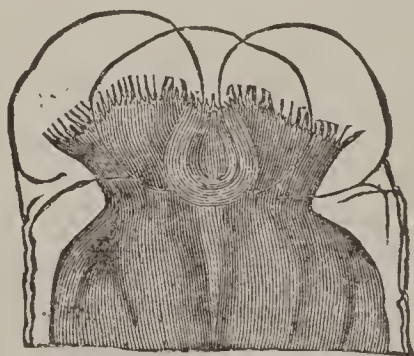
ASCARIS, *ās'kă-rīs*: genus of *Entozoa*, or intestinal worms, of the ord. *Nematoidea* of Cuvier and others. The ascarides have a body approaching to cylindrical, but thickest in the middle. They inhabit the intestines of animals. The species are numerous. One of the best known is *A. lumbricoides*, often called the common round worm, which occurs in the intestines of man and of some of the lower animals, as the hog, ox, horse, etc., and which often occasions severe disease, and sometimes death, particularly when it ascends from the intestines to the stomach. Its presence even in its most ordinary situation in the small intestines is attended with unfavorable effects upon the



Ascaris lumbricoides (male).

One-third of the true linear dimensions; *a* is the head of the worm.

general health; and the greater the number present—which, however, is not usually large—the greater, of course, is the injury; although when they remain in the intestines, worms of this species are less injurious and less annoying than other and even much smaller intestinal worms. In subjects otherwise diseased, they occasionally find their way out of the intestines into the closed serous cavities of the body, and even pass through ulcerated parts of the external integument; but the mouth is formed only for suction, and is provided with no means of boring



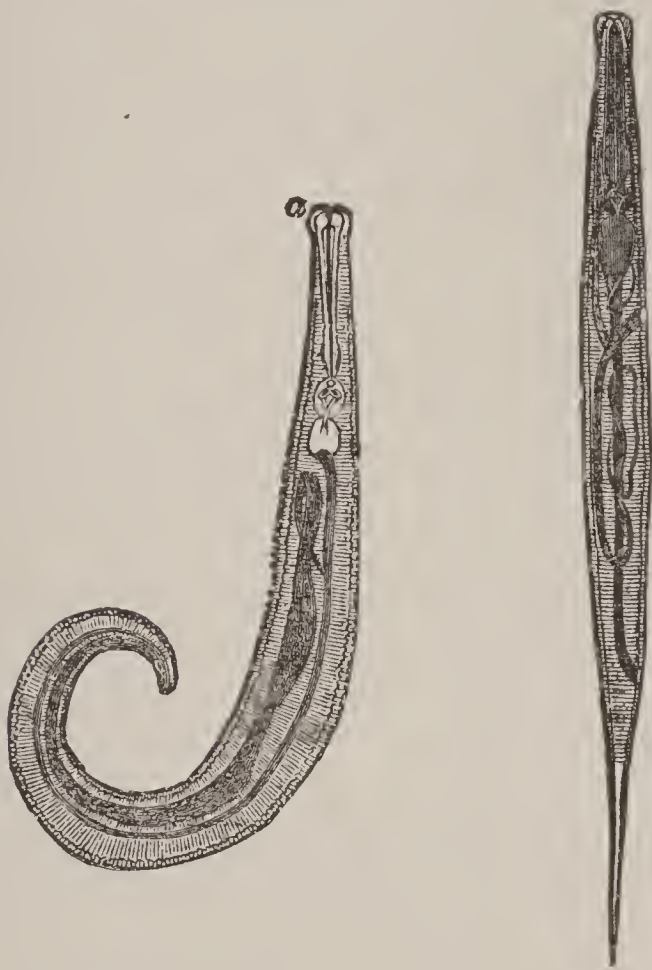
The mouth of *Ascaris lumbricoides*, magnified.

Showing the fleshy tubercles spread out, with cockscomb-like muscles interior to them, and the entrance to the intestinal canal.

through the healthy intestine. An immense number of remedies (anthelmintics or vermifuges) have been proposed and used to expel this parasite, some of which are very effectual. They do not in general kill the worms, but act by making their dwelling-place disagreeable to them. See VERMIFUGE. It is, however, remarked by Küchenmeister, in his work on Parasites, that the treatment of cases of this description is as yet purely empirical, because, although there must be a condition of the intestinal canal which favors the thriving of worms, we are by no means certain what it is.

ASCARIS.

The *A. lumbricoides* is ordinarily, in size and appearance much like the Common Earthworm (*Lumbrus terrestris*), from which resemblance it has received its specific name, although the resemblance is rather in general form than in more essential characteristics. It has been seen fifteen inches in length. Its mouth consists of three fleshy tubercles, which can be spread out upon the intestine to form a broad circular sucker, and within which there is a small tube capable of being protruded. The alimentary canal consists of a muscular gullet and stomach, and a thin-walled intestine. Between the muscular layers of the body is produced a pale reddish oily matter, with a strong



Ascaris vermicularis (male).
Magnified twenty-five diameters;
a, the mouth.

Ascaris vermicularis
(female).
Magnified eight diameters.

and very peculiar odor, which is gradually communicated to spirit in which the worm is preserved. The males are smaller than the females, and much more rare. The females produce eggs in great numbers; but it is uncertain if ever they are developed within the intestine in which the parent worm resides. They are certainly capable of being developed elsewhere, and probably the young enter the intestines of the animals of which they are eventually to be the parasites, after having spent a certain stage of their existence in very different circumstances; the worm in a very young state having never been found in the intestines of man or of quadrupeds, the situation of its per-

ASCELLI—ASCEND.

fect development. The inhabitants of damp valleys are believed to suffer more than others from the *A. lumbricoides*. It is said also to be particularly frequent in persons who are much accustomed to eat raw leaves and roots; and it has been supposed that the young may exist, perhaps in an encysted state, in the bodies of insects or other very small animals which are accidentally eaten along with such food, as the young tapeworm finds its way into the human intestines from its residence as a creature of very different size and form in the flesh of the sheep or the pig. The once prevalent idea of the equivocal generation of these worms is now completely abandoned.

A. vermicularis is another species usually referred to this genus, and is the only other species troublesome to mankind. It is known as the Thread-worm or Maw-worm, and is very common both in children and in adults. It infests chiefly the lower part of the intestines, and particularly the rectum, great numbers being often present together, and occasioning intolerable itching, irritation, and loss of sleep, although there is not in general much serious injury to health. The same anthelmintics employed against other intestinal worms are found efficacious also in the expulsion of this; and clysters are often employed with great success. The thread-worm is white, not more than half an inch in length, the male much less. Some recent authors of high reputation have separated this species from *A.*, and call it *Oxyuris vermicularis*, but the term *Ascarides* is often employed in medical works with exclusive reference to it; and indeed this name, derived from the Greek *askarizo*, to jump or move briskly, probably owes its origin to the liveliness of motion which this species exhibits. It has been recently discovered that its nervous system is very highly developed, consisting of many ganglia, with connecting and ramifying cords.

ASCELLI: see Ascus.

ASCEND, v. *ās-sēnd'* [L. *ascend'ērē*, to ascend—from *ad*, to; *scando*, I mount up; *scansus*, mounted up: It. *ascendere*]: to mount up; to go up; to rise. ASCEND'ING, imp.: ADJ. in *bot.*, rising erect from the ground and forming a curve; applied to ovules attached a little above the base of the ovary. ASCEND'ED, pp. ASCENDABLE, a. *ās-sēnd'ā-bl*, that may be ascended. ASCEND'ANT, a. superior; surpassing; in *astron.*, above the horizon: N. commanding influence; superiority. ASCENDENCY, n. *ās-sēnd'ēn-sī*, power; controlling influence. ASCENSIVE, a. *ās-sēn'siv* [L. *ascensus*, mounted up]: rising or tending to rise. ASCENSION, n. *ās-sēn'shūn*, the act of going up. ASCENSIONAL, a. *-āl*, pertaining or relating to. ASCENT, n. *ās-sēnt'*, act of rising; rising of a hill; an eminence. RIGHT ASCENSION, in *astron.*, the arc of the equinoctial intercepted between the first point of Aries and the circle of declination passing through the place of the heavenly body. ASCEN'SION-DAY, n. the day on which our Lord's ascension is commemorated. —SYN. of 'ascend': to mount; arise; rise; climb; scale; tower; soar;—of 'ascendency': influence; sway; prevalence; domination; control; authority; dominion.

ASCENSION—ASCERTAIN.

ASCENSION, *ăs-sĕn'shŭn*: one of the comparatively few single islands on the globe, being about 800 m. n.w. of St. Helena, and almost as far to the s.s.w. of St. Matthew. It is said to have received its name from its discovery by a Spanish navigator on Ascension-day. It is nearly in the middle of the South Atlantic, the lat. of its fort being $7^{\circ} 55' 55''$ s.; and its long. $14^{\circ} 25' 5''$ w. A. is 8 m. long by 6 broad; about 35 sq. m. Though discovered as early as 1501, yet it remained uninhabited till 1815, when, in connection with Napoleon Bonaparte's detention in St. Helena, the English took possession of it. It is now used as a naval victualling-station and hospital. Like St. Helena, it is of volcanic origin, and generally mountainous—one peak rising to a height of 2,870 ft. From the extreme dryness of the climate, which, however, is healthful, the surface is nearly destitute of verdure. Among indigenous productions are the tomato, castor-oil plant, and pepper; European vegetables are cultivated. Pop. (1901) 165, 15 being residents on the island, and 12 being in the Royal Naval Hospital. See Mrs. Gill's *Six Months in A.* (1879).

ASCENSION, RIGHT [Ger. *gerade aufsteigung*]: in *astron.* one of the arcs which determine the position relatively to the equator of a heavenly body on the celestial sphere, the other arc being the declination. See ARMILLARY SPHERE (under ARMILLA). It is the arc of the equator intercepted between the first point of Aries (q.v.), and the point at which the circle of declination passing through the star cuts the equator. Measured always from w. to e., right A. on the heavens corresponds to longitude on the earth. The right A. of a heavenly body is ascertained by means of the transit instrument and clock. The transit instrument determines its meridian passage, and the transit clock gives the time at which this takes place. When the first point of Aries is in the meridian, the clock stands at 0 hours, 0 minutes, 0 seconds, and it is so arranged as to indicate 24 sidereal hours, the time that elapses between two successive passages of that point. The reading of the clock, therefore, at the passage of any heavenly body gives its right A. in time, and this, when multiplied by 15, gives the same in degrees, minutes, and seconds. The right A. is usually given, however, in time. The old term, *oblique A.*, was given to the right A. of the point of the equator that rose simultaneously with the heavenly body; and the difference of the oblique and right A. was called the 'ascensional difference.'

ASCENSION-DAY, or HOLY THURSDAY: day on which Christ's ascension is commemorated; one of the great religious festivals of the Christian Church, traceable from about the middle of the 4th c. It occurs on the fortieth day after Easter (Acts, i. 3). Connected with the religious observances of this day were certain civic ones; which in some parts of England and Scotland are continued to this day—viz., *beating the bounds, or riding the marches*—though their religious connection is apparently forgotten. See ROGATION DAYS: PERAMBULATION.

ASCERTAIN, v. *ăs'sĕr-tān'* [OF. *acertainer*—from L.

ASCETIC.

ad: F. *certain*, certain—from L. *ad*, to; *certus*, sure]: to make certain; to make sure by examination; to establish. AS'CERTAIN'ING, imp. AS'CERTAINED', pp. -*tānd'*. ASCERTAINABLE, a. *ās'sēr-tān'ā-bl*, that may be made sure of by search or examination. ASCERTAINMENT, n. *ās'sēr-tān'mēnt*, establishment; discovery. AS'CERTAIN'ER, n. one who.

ASCETIC, n. *ās-sēt'ik* [Gr. *askētikos*, relating to the practice of anything; *askētos*, exercised, practiced; *askēsis*, the discipline practiced by the wrestlers]: one unduly rigid or austere; one who retires from the world: ADJ. retired from the world; austere; also ASCET'ICAL, a. -*ī-kāl*. ASCET'ICS, n. -*īks*, a treatise on the subject of asceticism or giving rules to be observed by ascetics. ASCETICISM, n. *ās-sēt'ī-sizm*, the practice of ascetics. Among the Greeks, *askēsis* denoted the exercise and discipline practiced by the athletes or wrestlers, who had to harden their bodies by exertion and to avoid all sensual and effeminating indulgences. In the schools of the Greek philosophers, especially of the Stoics, the word which signified the discipline practiced by the wrestlers, signified the practice of mastering the desires and passions, or of severe virtue. In these senses it passed into the language of the early Christians. The language of the apostle Paul in comparing the Christians to wrestlers who had to contend with Satan, the world, and the flesh, contributed to this. But the philosophy of the time had more to do with it, which held the freeing of mind from matter to be the means of union with God; or, at least, that the refraining from all luxurious pleasure was the way to restore the soul to its original purity. To understand the vast influence that ascetic ideas have exercised on the Christian religion, we must look beyond the bounds of the Christian history. Their root lies in the oriental notion, that the Absolute or All is the only real existence; and that individual phenomena, especially matter in all its shapes, are really nothing, and are to be despised and avoided, as involving the principle of separation from the Absolute. The East, accordingly, is the native soil of A. The glowing imagination of the oriental carries the practice of it to a monstrous extravagance, as is seen in the frightful self-tortures inflicted by the yogins (see YOGA) and fakirs (see FAKIR), the suicides in the sacred Ganges and otherwise, and the practices recently prevalent of offering children in sacrifice, and of burning widows; most of which, however, have been suppressed by the British government. Buddhism, which may be considered as a kind of puritan revival or reformation—the Methodism of the Indian religion—carried the principle beyond its previous bounds. In its condemning the world; in its inculcating a life of solitude and beggary, mortification of the body, and abstinence from all uncleanness and from all exciting drinks, the object was to keep as distant and detached as possible from this 'Vale of Sorrow.' See BUDDHISM and NIRVANA. The sober Chinese, and the more moral and rational Persians, never carried asceticism to these extravagances; and the earnest Egyptians sought to confine it to monogamy of the priests, abstaining from the flesh of swine and from beans, rigid

ASCETIC.

purity, circumcision, moderate flagellation, and frequent contemplation of death (for which there were remembrancers provided, even in the midst of festivities). These are certainly milder forms of A., but the principle is the same.

It is in the light of this fore-history that we must consider Judaic and Christian asceticism. In the oriental mind, especially in Egypt, circumcision, avoiding of all uncleanness, and fasting, were signs of humiliation before God; and in the Mosaic ritual they were conditions of the favor of the holy Jehovah. Voluntary vows, abstaining even from lawful food, wine, etc., were held to have a special purifying, consecrating efficacy, particularly for prophets and men of special callings. But self-castigation was foreign to the sobriety of Judaism, and even hermitism came into established practice only shortly before Christ, in Palestine among the Essenes (q.v.), in Egypt among the Therapeutæ (q.v.), though doubtless Jewish A. had become more stern and gloomy since the exile in Babylon.

A. was far less congenial to the reflective nations of the West, above all to the cheerful Greeks. A Greek felt himself entitled to enjoyment as well as his gods; hence Greek religious festivals were pervaded by cheerfulness. The only exception appears to be the Eleusinian mysteries, which never took hold of the people generally, and the passing phenomenon of the Pythagorean fraternity. The attack made by the Socratic school upon the body as the prison of the soul—a view reminding one of the East—and the extravagant contempt for the elegances, and even decencies, of life professed by the later Stoics and Cynics, were no genuine fruits of the popular Greek mind; and we must also ascribe to the infusion of oriental philosophy the ascetic tendencies of Neoplatonism, in holding abstinence from flesh and from marriage as chief conditions of absorption into the divinity.

It was into the midst of these ideas that Christianity was introduced. The Jewish converts brought with them their convictions about fasting. Fasting and Nazaritic observances were thought sanctifying preparatives for great undertakings; and the inculcation of abstinence from marriage, on the ground of the expected speedy reappearance of Christ, falls in with the same notion, namely, that the flesh, that is, the sensuous part of our nature, is the seat of *sin*, and must therefore, first of all, be rigorously chained. The oriental traditions of A.; the spirituality of Christianity, pointing away from earth to heaven; opposition to the corruption of the heathen world; the distinction made between belief and knowledge, as a higher and lower stage of intelligence, leading to a corresponding distinction of a higher and lower stage of virtue,—all combined to make the Christians of the first two centuries hold aloof from the world and its wisdom, and favor abstinence from marriage, more especially on the part of the clergy. This ascetic spirit began as early as the commencement of the 2d c. to court trial in the perilous practice of men and women living together under vows of continence. We find Cyprian dissuading from the dangerous experiment. and even the authority of

ASCETIC.

the church interposed to the same effect. But during the first three centuries no irrevocable vows yet bound the devotees to a lifelong A. Fasting was also comparatively rare.

But the tendency to outward manifestations began to grow stronger. The inward and spiritual life of the Christians had greatly declined; and if the previous bloody persecutions had driven individuals from human society into the deserts, the growing secularization of the church, after Christianity became the state religion, had the same effect to a still greater degree. All this paved the way for the chief manifestations of A.—namely, monasticism, which the church deemed herself compelled by the overwhelming tide of opinion within and without to recognize, and take under her charge. See MONACHISM. From the African Church, represented by Tertullian and Augustine, a spirit of gloomy and crushing supernaturalism spread deeper and deeper over the Western Church generally, intensifying the ascetic tendencies, and leading to still more marked separation from a despised world. There were not wanting healthier minds—as Jovianus, Vigilantius, and others—to raise their voices against fasting, monkery, and the outward works of A. generally; but such protests were vain, and became more rare.

From the 11th c., the Cathari, Waldenses, and other sects, though themselves ascetics in some sense, yet assailed the external A. of the church; the classic Petrarch fought on the same side; and so did Wickliffe, Huss, and Jerome of Prague, in their premature struggle at reformation. After a preliminary skirmish by Erasmus, the struggle was decided in the reformation of the 16th c. The fundamental principle of that movement, that salvation is secured by justification through faith, and not through dead works, struck at the root of monkery and mortification in general. But the victory has not been so complete as is often assumed. The ascetic spirit often shows itself still alive under various disguises even in Protestantism. The Mennonites inculcated a rigid A.; and with the Shakers of America, celibacy is practiced as a virtue. The essence of A. is to hold bodily self-denials and suffering to be meritorious in the sight of God, in and for themselves, without regard to their promoting the good of others or their improving the individual's own character. In this light, some traits presented by the earlier Puritanism, Methodism, and Quakerism may appear ascetic. It is not impossible that vegetarianism, total abstinence, and other recent austerities, though advocated on other grounds, recommend themselves to the feelings of many from their falling in with this deep-seated propensity to A., which seems a perverted development from the great truth that *subjection* to the flesh degrades man's spirit.

Even in the Roman Church, ascetic practices have been modified in recent times; fastings are less rigorous, and the self-sacrifice of conventual life is more directed to beneficial ends. Mohammedanism has undergone the same change. In the Greek Church, monasticism had always a milder form.

ASCH—ASCHAM.

ASCH, *ásh*: t. in the w. of Bohemia, 14 m. w.n.w. from Eger. It has cotton, silk and woolen manufactures. Pop. (1880) 13,209.

ASCHAFFENBURG, *á-sháf-fén-bórg'*: chief t. on the right bank of the Main, in the Bavarian district of Unterfranken; lat. $50^{\circ} 1'$ n., long. $9^{\circ} 7'$ e. It is built upon an eminence, and has both a healthful and attractive situation; but the streets are narrow, irregular, and slope steeply towards the river. The castle of Johannisberg, built 1605-14, by Johann Schweikhardt, elector of Mentz, and the favorite hunting residence of many of his successors, forms a quadrangle, with towers at each corner, and overlooks the whole town. Besides the collegiate church, the military barracks, and the town hospital, A. possesses a Roman villa, built by King Louis I., 1849, in imitation of the Castor and Pollux edifice discovered at Pompeii. A. is celebrated for its manufacture of colored papers; it has considerable trade in wood, building-stone, tobacco, wine, etc. A. existed as early as the invasion of Germany by the Romans, who built a castle here. In 974, Otto I., Duke of Swabia and Bavaria, founded the collegiate church, which greatly increased the prosperity of the place. After Otto's death the town came into the possession of the abps. of Mentz, and remained with them until the dissolution of the Germanic empire. In 1814, with the principality of which it is the capital, it was ceded to Bavaria. Pop. (1894) 13,630, principally Rom. Cath.

ASCHAM, *ás'kám*, ROGER: 1515-68; b. Kirby Wiske, Yorkshire: distinguished English writer and classical scholar. He received his early education in the family of Sir Anthony Wingfield, and in 1530 entered St. John's College, Cambridge, where he took his degree of B.A., 1534. The study of the classics, especially Greek, had recently been revived at Cambridge, and the natural bent of A. impelled him with ardor to these studies. His reputation as a classical scholar soon brought him numerous pupils; and in lack of a Greek chair at that time, he was appointed by the univ. to read lectures in the public schools. He at first opposed the then new method of pronunciation, still used in England; but afterwards adopted and defended it. His leisure hours were given to music, penmanship, and archery. In defense of the latter art, he wrote, in 1544, a treatise entitled *Toxophilus*, the pure English style of which, independently of its other merits, ranks it with classical English literature. For this treatise, dedicated to Henry VIII., he was rewarded with an annual pension of £10, equivalent to about £100 of the present money. About the same time, he was appointed university orator. In 1548, on the death of his former pupil, Grindal, he was called to supply his place as master of languages to the Lady Elizabeth. In this office he gave the highest satisfaction; but at the end of two years abruptly resigned it, on account of some offense he had taken at some persons in the princess's household. That he did not lose favor at court, however, is manifest, from his

ASCHERSLEBEN—ASCIDIA,

having soon been appointed secretary to Sir Richard Morysin, ambassador to the court of Charles V. He spent three years in Germany, and published an account of his observations in that country. He also made a short tour in Italy. During his absence, he had been appointed Latin secretary to Edward VI. On his return, after the death of the king, the interest of Gardiner, Bp. of Winchester, secured his appointment to the same office under Mary; his pension also was doubled. His prudence and moderation preserved him from offending by his Protestantism. After the death of Mary, Elizabeth retained him at court in the double capacity of secretary and tutor, which he discharged till his death. His principal work, *The Schoolmaster*, a treatise on classical education, was pub., 1571, by his widow. His Latin letters and poems have been frequently reprinted. The best edition of the former is that of Elstob (Oxford, 1703). To an edition of his English works, by the Rev. J. Bennet (1767), is prefixed a life by Dr. Johnson.

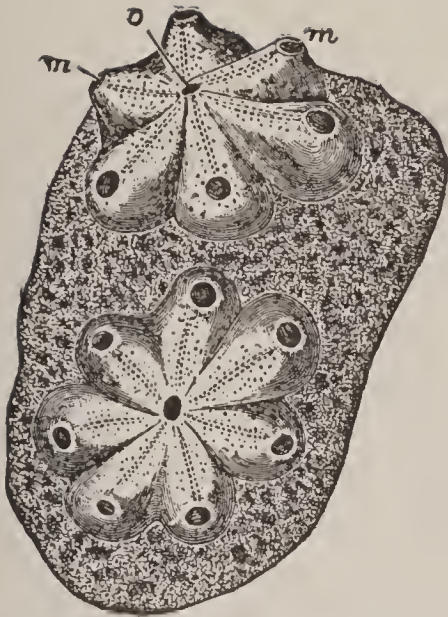
ASCHAM, a case for the reception of the bow, arrows, strings, and other accoutrements of the archer, derives its name from the author of the *Toxophilus*.

ASCHERSLEBEN, *áš-ěrs-lā'bén*: t. in the dist. of Magdeburg, prov. of Prussian Saxony; lat. 51° 46' n., long. 11° 27' e.; on the river Eine; 32 m. distant from Magdeburg. The inhabitants are occupied chiefly in agriculture and gardening; its trade is not very important. It has, however, considerable manufactures of woollens, linens, earthenware, etc. Pop. (1880) 19,501; (1890) 22,865.

ASCIDIA, n. plu. *áš-síd'í-ă*, or *áš-kíd'í-ă*, or ASCIDIANS, n. plu. *-í-ănz* [Gr. *askidion*, a little bag]: small marine organisms, belonging (with the Salpidæ) to the *Tunicata*. The classification of the *Tunicata* has been much debated. Once grouped with the Mollusca, they, the Polyzoa, and Brachiopoda were subsequently separated from the mollusks, and made to constitute the *Molluscoidea*; while recently the affinities of the A. with the Vertebrata have had special interest in connection with the theory of development. See MOLLUSCA: POLYZOA: ZOOLOGY: DARWINIAN THEORY. The ascidians, with the other *Tunicata*, are acephalous, or destitute of a head, and are enclosed, not in a shell, but in an elastic tunic with two orifices, composed of a substance apparently identical with the *cellulose* of plants, consisting only of carbon and hydrogen. Within the external tunic is a muscular membrane, regarded as corresponding to the *mantle* of other mollusca, and the openings of which agree with those of the tunic. The greater part of the cavity of the mantle forms a branchial sac, the lining of which, folded in various ways, constitutes the gills (*branchiæ*); and into it, by the respiratory movements, currents of sea-water are continually brought, passing out through the vent or anal orifice. Multitudinous *cilia* in the mouth and branchial sac cause by their action this continual flow of water. The motion of the *cilia* is apparently quite involuntary. By this flow

PLATE 17.

Artichoke
Ascidian



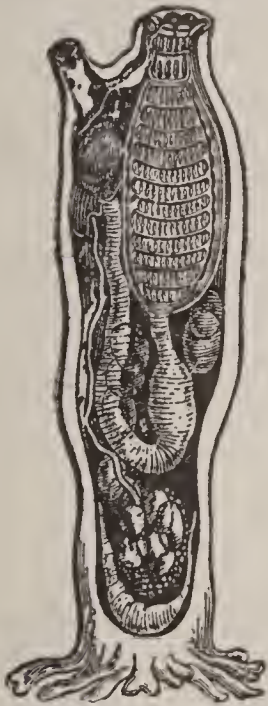
Compound Ascidian (after Milne-Edwards). Rosettes of 6 or 7 united individuals, with separate inhalent, but united exhalent apertures; *m*, the inhalent aperture; *o*, the common exhalent apertures. The colonies are attached to a piece of seaweed.



Ferula Asafetida.



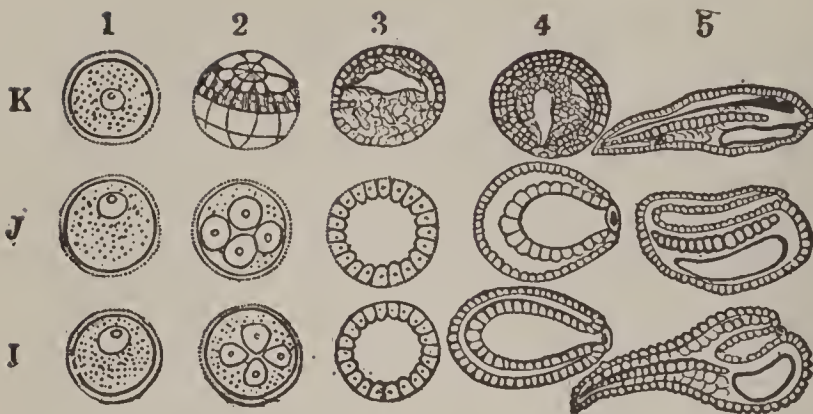
As (half real size).—Specimen in British Museum.



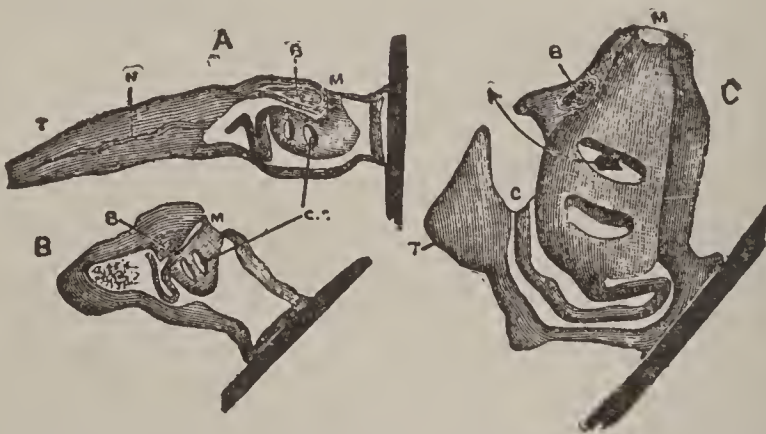
Structure of a simple Ascidian, showing inhalent aperture, leading into respiratory pharynx; looped alimentary canal, opening along with genital duct into cloacal chamber; nerve ganglion between inhalent and exhalent apertures; reproductive organs near the base, eggs in body-cavity, etc.; heart at very base; fixing processes. (After Hæckel.)



Artichoke.



Development of: I, Ascidian; J, Amphioxus; K, Frog. 1, ovum; 2, segmenting ovum; 3, morula, or blastosphere; 4, gastrula; 5, further advanced embryo.



Attachment and degeneration of larval Ascidian: A, Immediately after attachment to stone or shell; B, showing the degeneration of tail, spinal cord, etc.; C, a young Ascidian which exhibits the symmetry and essential structure of the adult; *b*, brain; *m*, mouth; *n*, notochord; *g, s*, gill-slits; *t*, tail.



Ascidians.—1, *Perophora*: *a*, mouth; *b*, vent; *c*, intestinal canal; *d*, stomach; *e*, common tubular stem; 2, *Ascidia echinata*; 3, *Ascidia virginea*; 4, *Cynthia quadrangularis*; 5, *Botryllus violaceus*.



Portable
Aspersorium.

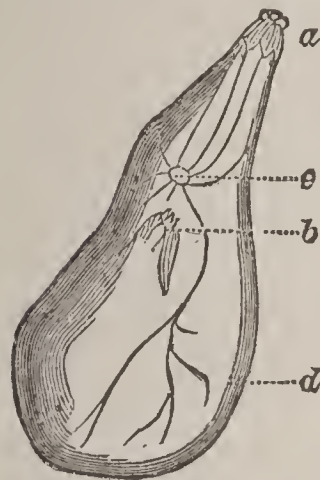


Aspergillus.

ASCIDIA.

of water, the particles of food requisite for the animal are brought in, so that the aeration of the blood and the supply of the stomach are carried on together and by the same means. The esophagus or gullet opens from the branchial sac, which is indeed regarded as probably an expansion of the upper part of it—a dilated pharynx. Under the branchial sac is the stomach; and the alimentary canal, which is more or less tortuous, finally returns upon itself, so that the two orifices are not far separate. The liver consists of follicles produced into tubes, and

communicating with the stomach by a single opening. There is a heart and a circulation of blood, with the remarkable peculiarity of alternations in its course, the circulation every now and then pausing and being reversed. The transparency of many of the ascidians permits these and other internal movements to be easily observed. The nervous system is very simple, consisting of a single ganglion, situated between the mouth and the anal orifice, sending out filaments to both of them, and other branches over the surface of the mantle. The mantle is capable of contracting suddenly to eject a jet of water, and with it any body the presence of which is disagreeable. The mantle contracts and

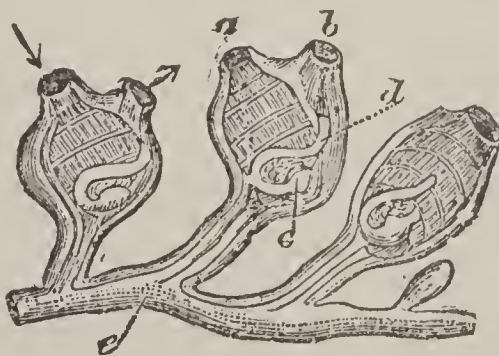


Nervous System of
Ascidian.

a, mouth; *b*, vent; *c*, ganglion; *d*, the mantle (the external tunic being removed).

ejects water, also when the animal is touched, and this appears to be the only means of defense. There is no trace of eyes or other organs of special sense.

The ascidians are found in all seas, and often constitute an important part of the food of fishes. Some of them are occasionally used as human food, as *Cynthia microcosmus* on the shores of the Mediterranean. Many of them



Section of Social Ascidian.

a, mouth; *b*, vent; *c*, stomach; *d*, intestinal canal; *e*, common tubular stem.

are very small, but some attain a size of five or six inches in diameter, and when touched eject water to a considerable height, the largest of them to about three feet. They are all fixed by the base, in their mature state, to some

ASCIDIA.

solid substance, as a rock or seaweed ; sometimes by the intervention of a stalk or peduncle. In some kinds (*Social Ascidians*), the peduncles of a number of individuals are connected by a tubular stem, and to some extent they have a common circulation of blood, although each has its own heart, respiratory apparatus, and digestive system; and if a ligature is drawn around the peduncle of one so as to cut it off from the common circulation, circulation takes place in it as in a solitary ascidian. In other kinds (more strictly called *Compound Ascidians*—which designation, however, is by some authors applied to those just described, while these are called *Aggregate Ascidians*), the tunics of many are united into a mass, and they form systems like zoophytes. The compound system sometimes bears a general resemblance to an actinia. Very frequently it forms a slimy crust upon algæ, shells, etc., or projects in globular or conical masses, 'more like a lump of inanimate matter than a being endowed with vitality'—'a curious and interesting internal organization, veiled by the coarsest exterior.' The individuals are sometimes connected by a gelatinous flesh, which consists of cellulose, and there is sometimes a calcareous deposition in this connecting substance as in the compound polyps. The individuals in these systems have always sprung by gemmation from one, and both the solitary and compound ascidians propagate by eggs. The young have the power of active locomotion, resemble tadpoles in form, and swim by means of a vibratile tail, which disappears when they settle, being usually detached by contraction at the base. The sexes are supposed to be distinct in only some of the ascidians. The ovaries are usually large, and the ova are carried away by the stream which passes through the animal. It is in the solitary ascidians



Ascidian (young).

that the highest organization is to be observed, and in which a distinction of sexes appears. In them, a muscular ring surrounds the mouth, and can be closed to exclude what is unfit to enter. Within this aperture there is also a fringe of tentacula, short and simple, or longer and minutely divided. In the compound ascidians, gemmation does not begin till the single animal has been fully developed ; thereafter, bud after bud is produced, according to the plan upon which the compound system is constructed, and 'the procreative force of the germ-mass finally exhausts itself in the formation of male and female organs, in which that force is again mysteriously renewed under its two forms of the spermatozoon and the germinal vesicle, by the combination of which the reproductive cycle again begins its course.'

The special interest in the A. of late years has been in consequence of the discovery, by a Russian naturalist, Kowalevsky, of what is believed to be a notochord (embryonic backbone), and above it a spinal nervous cord, in the tadpole-shaped larva of an ascidian ; but this

ASCIDIOIDA—ASCLEPIADACEÆ.

is questioned by some naturalists. See Packard's *Zoology*.

ASCIDIOIDA, n. plu. *ās-kīd'ī-oy'dā* [Gr. *askidion*, a little bag; *eidos*, resemblance]: a class of molluscous animals which have often the shape of a two-necked bottle; same sense as *ascidia*; synonym of 'Tunicata.'

ASCIDIUM, n. *ās-kīd'ī-ūm*, ASCID'IA, n. plu.: in *bot.*, a form of leaf in which the stalk is hollowed out and closed by the blade as by a lid; a pitcher-leaf.

ASCII, n. plu. *ās'ī-ī*, or *āsk'ī-ī*, ASCIANS, n. plu. *ās'ī-ānz*, or *āsk'ī-ānz* [L. *ascius*, shadowless—from Gr. *askiōs*, shadowless, dark—from Gr. *a*, without; *skiā*, a shadow]: applied to the inhabitants of the torrid zone, who are shadowless at noon. They are also called AMPHIS'CII, because when not shadowless their shadows will at noon fall northwards one part of the year and southwards at another. The inhabitants of the n. temperate zone at noon have their shadows always falling northwards, and those of the s. temperate zone always south, and are called ANTIS'CII, *-sī-ī*. In the frigid zones, when the sun is above the horizon, the shadows of the inhabitants are directed to every point of the compass in succession, and they are called PERIS'CII, *-sī-ī*.

ASCITÆ, *ās-sī'tē*, or ASCITANS, *ās-sī'tānz* [Gr. *askos*, a leathern bottle]: a sect of Montanists who arose in the 2d c. Their name was designed to express the fact that some Bacchanals of their party believed the passage in Matt. ix. 17, which speaks of pouring new wine into new bottles, required them to blow up a skin or bag, and dance around it when inflated, which accordingly they did with suitable vigor, as an act of solemn worship.

ASCITES, n. plu. *ās-sī'tēz* [Gr. *askos*, a cavity or bladder]: dropsy of the abdomen; a morbid accumulation of serous fluid in the cavity of the peritoneum. ASCITIC, a. *ās-sīt'īk*, or ASCIT'ICAL, a. *-ī-kāl*, dropsical. ASCIT'ICALLY, ad. *-lī*. See DROPSY: LIVER, DISEASES OF THE.

ASCITITIOUS, a. *ās'sī-tīsh'ūs* [L. *ascis'co*, I receive, I adopt]: additional; supplemental.

ASCLEPIAD, n. *ās-klē'pī-ād*: a choriambic verse first used by Asclepias, consisting of four feet—viz., a spondee, two choriambi, and an iambus. ASCLEPIADEAN, a. *ās-klē-pī-ād'ē-ān*, or ASCLEPIAD'IC, a. *-īk*, pertaining or relating to.

ASCLEPIADACEÆ, *ās-klē'pī-ā-dā'sē-ē*, or ASCLEPIA'DEÆ: nat. ord. of dicotyledonous or exogenous plants, mostly shrubs, often with twining stems, almost always with milky juice. The leaves are entire, and have cilia between their stalks in place of stipules. The flowers are peculiar in their structure, though symmetrical and regular. The calyx is divided into five segments, the corolla into five lobes; there are five stamens, and the stigma has five angles. The filaments are usually united to form a tube, generally furnished with a coronet of peculiar hood-shaped appendages; the anthers are two-celled, the pollen grains

ASCLEPIADACEÆ.

cohering in wax-like masses, which fall out of the anther cells, and become attached to glands at the angles of the stigma; there are two ovaries and two styles very close together, and often very short, with one dilated stigma common to both. The fruit consists of two follicles, or, by abortion, of one only, having numerous imbricated seeds with thin albumen, the ends of the seeds terminating in long down. There are about one thousand known species, natives chiefly of warm climates. Some of them are cultivated in gardens and hot-houses, upon account of



Vincetoxicum officinale.
a, root; b, fruit; c, a single seed.

their curious or beautiful flowers, among the most familiar of which are some of the species of *Asclepias* (q.v.) or Swallow-wort; perhaps none of them is more highly esteemed than *Stephanotis floribunda*, the fragrance of which equals its beauty; it is sought for bridal garlands. No hot-house climber is better known than *Hoya carnosa*, at each flower of which a drop of honey hangs. A number of species are medicinal, as Indian Sarsaparilla (q.v.), (*Hæmidesmus Indicus*); Mudar (q.v.), (*Calotropis gigantea*), highly prized in the East Indies; *Sarcostemma glaucum*, the Ipecacuanha of Venezuela; *Tylophora asthmatica* and *Secamone emetica*, the roots of which are used as emetics, and in smaller doses as cathartics, and the former of which is reckoned among the most valuable medicinal plants of India; *Cynanchum acutum*, which yields a purgative called Montpellier Scam-

ASCLEPIADÆ—ASCLEPIADES.

mony, and *Vincetoxicum officinale*, which possesses similar properties. Argel (q.v.), much used for adulterating senna, belongs to this order.—The down of the seeds is used sometimes as a substitute for silk or cotton (see ASCLEPIAS); and the stems of not a few species afford useful fibres, as those of the *Asclepias Syriaca* (see ASCLEPIAS), the Mudar (q.v.), and other species of *Calotropis*, natives of India and Persia, *Hoya viridiflora*, *Holostemma Rheedianum*, etc. The Mudar or Yercum fibre is very highly extolled by Dr. Royle (*Fibrous Plants of India*). The bark of *Marsdenia tenacissima*, a small climbing-plant, yields a fibre called *Jetee*, of which the Rajmahal mountaineers make bowstrings, remarkable for their great elasticity, which they are supposed to owe in some measure to the presence of caoutchouc. The fibre of *M. Roylei* is used in Nepal. *Orphanthera viminea*, which grows at the base of the Himalayas, and has long leafless wandlike stems of ten ft. in height, yields a fibre of remarkable length and tenacity, supposed to be peculiarly suited for rope-making. The fibres of *Leptadenia Jaque-montiana* and *Periploca aphyllum* are used in Sindh for making the ropes and bands used in wells, as water does not rot them.—The milky juice of most species of A. is acrid, but in some it is bland, and they are used for food, as is the milk itself of the Kiriaghuna or Cow-plant of Ceylon (*Gymnema lactiferum*). A few species, as *Marsdenia tinctoria*, a native of Silhet, yield indigo of excellent quality. The flowers of the genus *Stapelia* have a strong smell of carrion, and flies sometimes lay their eggs upon them, as it were, by mistake. There are about 20 species in e. and central United States, of which the Butterfly Weed (*A. tuberosa*) is the most brilliant.

ASCLEPIADÆ, or ASCLEPIADES: see ÆSCULAPIUS.

ASCLEPIADES, *ās'kle-pī'ă-dēz*: a Greek physician, b. at Prusa, in Bithynia; lived during the early part of Cicero's life. He has been confounded with several other persons of the same name. He seems to have wandered about considerably before he finally settled at Rome; as we read of his being at Alexandria, Parium on the Propontis, and Athens. It is not known either when he was born or when he died. A. was opposed to the principles of Hippocrates in medicine. Pliny, who professes very little respect for him, reduces his medicinal remedies to five: abstinence from flesh, abstinence from wine under certain circumstances, friction, walking, and 'gestation' or exercise in carrying, by which he proposed to open the pores, and let the corpuscles which caused disease escape in perspiration; for his leading doctrine was, that all disease rose from an inharmonious distribution of the small, formless corpuscles of which the body was composed. He is said to have been very popular with the Romans on account of his pleasant and simple cures. His maxim was, that a physician ought to cure surely, swiftly, and agreeably. A. is also alleged to have been the first who distinguished between acute and chronic diseases, but his knowledge of anatomy was apparently slight. The fragments of his

ASCLEPIAS—ASCOLI.

writings which remain have been gathered together, corrected, and published by Gumpert, under the title, *Asclepiadis Bithyni Fragmenta* (Weimar, 1798).

ASCLEPIAS, *ás-klē'pī-ās*, or SWALLOW-WORT: genus of plants, type of the nat. ord. *Asclepiadaceæ*. The corolla is wheel-shaped and reflexed; the coronet fleshy, and each of its hooded tips has a horn. The species are generally upright—seldom climbing and twining—herbaceous plants with opposite, whorled, or alternate leaves. They are mostly American. The flowers are disposed in simple umbels between the leaf-stalks.—*A. Syriaca*, Syrian or Virginian Swallow-wort, sometimes called Virginian Silk, appears to be a native of N. Amer., and not of Syria as was supposed. It is frequently cultivated in flower-gardens. It has an unbranched stem 4–7 ft. high; thick, ovate leaves, covered with a grayish down on the under side, and large, stalked, nodding umbels of many dull red flowers, which diffuse a strong and sweetish odor. The whole plant is full of an acrid white milk, which contains caoutchouc. The young shoots are eaten in N. Amer. like asparagus, as those of *A. stipitacea* are in Arabia. A brown well-tasted sugar is prepared in Canada from the flowers; and the silk-like down of the seeds has been used for the manufacture of textile fabrics, either alone, or with wool or silk, but is more frequently employed for the preparation of wadding, and for stuffing mattresses and pillows. The plant is valuable chiefly for the fibre of its stalks, which is used for the manufacture of thread, cloth, ropes, nets, etc., in many parts of N. Amer., and on account of which it has been recommended for general cultivation in Europe. The fibre is said to be of superior quality. The plant rapidly extends by its creeping roots, and readily becomes a weed, where it has been introduced.—The roots of several other N. Amer. species are used as diaphoretics and expectorants, as *A. incarnata*, *A. tuberosa*, etc. The latter is a very ornamental garden-flower, and is called Butterfly Weed and Pleurisy Root in the United States, where it is frequent on stony and sandy grounds. *A. Curassavica* is called Wild Ipecacuanha in the West Indies, and a decoction of it is used by the negroes as an emetic and purgative.

ASCOLI, *ás-kō-lē* (anciently, *Asculum Picenum*): old city of Italy, cap. of the province Ascoli-Piceno; seat of a bishop; lat. 42° 50' n., long. 13° 37' e. It is built on a hill, on the right bank of the Tronto, which formed the boundary between the late Roman and Neapolitan territories. From the Adriatic, it is 16 m. w.; from Ancona, 53 s. Its harbor (Porto d'Ascoli) has some coasting-trade, and is defended by two forts. The town is beautifully situated, commanding a fine view of the fertile valley through which the river flows, and of the rugged Apennines, which here rise 7,212 ft.

In ancient times, it was inhabited by the Piceni, the descendants of a colony of Sabines, who maintained their independence against the Romans until B.C. 268. Nearly two centuries later, they were prominent in the Social

ASCOMYCETES—ASELLUS.

War; and on the taking of their town by Pompeius Strabo, were subjected to the severest punishments. The town was annexed to the papal states by Pope Clement V. 1426; and with them passed to the kingdom of Italy. Pop. (1901) 28,882.

ASCOMYCETES, n. *ās'kōm-ī-sē'tēz* [Gr. *askos*, a bladder; *mūkēs*, a mushroom]: in *bot.*, the group of Fungi which reproduce by asci. See ASCUS.

ASCOSPORES, n. plu. *ās'kō-spōrz* [Gr. *askos*, a bladder, and *spores*]: in *bot.*, the spores or reproductive cells developed in asci.

ASCRIBE, v. *ās-krīb'* [L. *ascribēre*, to add to a writing—from *ad*, to; *scribo*, I write—*lit.*, to add to a writing]: to impute to; to assign to as a cause; to attribute. ASCRIBABLE, a. *-bā-bl*, that may be attributed to. ASCRIBING, imp. ASCRIBED, pp. *ās-krībd'*. ASCRIPTION, n. *ās-krīp'shūn*, the act of attributing to. ASCRIPTIOUS, a. *-tī'shūs*, ascribed; imputed; assigned.

ASCUS, n. *ās'kūs*, ASCI, plu. *ās'kī* [Gr. *askos*: L. *ascus*, a bladder]: in *bot.*, large cells, in which new cells or spores, usually eight in number, are developed—a common mode of reproduction in certain cryptogams; called also ASCELLI. ASCIGEROUS, a. *ās-sī'ēr-ūs* [L. *gero*, to wear, to carry about]: having asci.

ASELLI, *ā-zel'ē*, ASEL'LIO, or ASEL'LIUS, CASPAR: abt. 1581—abt. 1626; b. Cremona: celebrated Italian physician. He served at first as a military surgeon, afterwards became prof. of anatomy and surgery at Padua. In 1622, while at Milan, he discovered the lacteal vessels. Before A.'s time, anatomists had supposed that the chyle was carried from the intestines into the liver by the mesenteric veins. One day, dissecting a living dog, he noticed for the first time the multitude of little vessels, which suck up the nutritive portion of the food. At first, he took them for nerves; but on pricking one with the point of his scalpel, a white liquid spurted out, and the discovery flashed on him in a moment. He seems, however, never to have understood or described them with complete accuracy. His treatise on his discovery was pub. a year after his death. It is entitled *De Lactibus, sive Lacteis Venis, Quarto Vasorum Mesaraicorum Genere, Novo Invento, Dissertatio*, and has several times been reprinted.

It is remarkable that such men as Gaspard Hoffman and Harvey zealously combated the opinions of A. It was nearly half a century before professional men admitted that a great discovery had been made in anatomy. See LACTEALS.

ASEL'LUS, in Ichthyology: generic name now disused, but by which the cod and other *Gadidae* were formerly sometimes designated. It is retained in the pharmacopœias, in the name of Cod-liver Oil, *Oleum jecoris aselli*.—The same generic name is now employed, in a different department of natural history, to denote a genus of small Isopod Crustaceans, one of which, *A. aquaticus*, is sometimes called the Water Hog-louse. This genus is the type of a family, *Asellidae*.

ASEPSIS.

ASEPSIS: n. *a-sěp' sīs* [Gr. *a*, without; *sepsis*, putrefaction]: in surgery a state of the most rigid cleanliness of the patient, of the surgeon and assistants, of all instruments used in the operation, and of the ligatures, sutures, and dressings. It differs from Antisepsis (see ANTISEPTIC) in that A. aims at exclusion of all germs of disease, while Antisepsis is directed toward their destruction. In order that a surgical operation may be performed aseptically the patient must be bathed, and the portion to be operated on must be scrubbed, shaved, and disinfected by a germicidal agent; the surgeon's and his assistants' hands must in like manner be scrubbed, particular attention being given to the finger-nails, under which germs find a fertile soil. The instruments are rendered sterile and free from germs best by heat, either dry or moist; so baking or boiling is resorted to. The sponges used to absorb blood must be absolutely aseptic, as must also the catgut used for ligatures, and the material for sutures, which may be silver wire, catgut, or silk. By thus precluding all possibility of the entrance of germs, the surgeon may now undertake operations, such as amputations or laparotomies, with every feeling of security, knowing that if his aseptic precautions have been perfect he may reasonably expect the wound to heal by primary union without fever, and without formation of a drop of pus. Since A. has been practiced operations are performed, with perfect recovery of the patient, that previously would have been considered foolhardy and certainly fatal; hospital gangrene is unknown, 'blood poisoning' almost unheard of, and the mortality following operations reduced to a minimum.

ASEPTA—ASGILL.

ASEPTA, n. *ă-sěp'tă* [Gr. *aseptos*, not liable to putrefy]: substances not liable to putrefaction. ASEPTIC, a. not liable to putrefy.

A'SES [singular in Old Norse *As*, pl. *Aesir*; in Gothic, *Ans*; in Saxon. *Os* (*Es*): a race of gods in Northern or Scandinavian Mythology (q.v.), though not the oldest, yet the most powerful, like the Jupiter dynasty among the Greeks. They are usually considered as numbering twelve gods, and as many goddesses. The gods are—Odin, Thor, Baldur, Niord, Freyr, Tyr, Bragi, Heimdal, Widar, Wali, Uller, and Forseti; the best known of the goddesses—Frigga, Freyja, Idunna, Eira, and Saga. The worship of the A., or the Odin religion, at least in its outlines, was rooted not only among the nations of Scandinavia, but among the Germanic races generally. Besides other traces, proofs of its prevalence are found in a multitude of Gothic, Saxon, and Old High German proper names; many of which continue in use, though their connection with German paganism passes unperceived: Oswald, Esmond, Oswin, Anselm, Ansgar, etc.

ASEXUAL, a *ă-sěks'ŭ-ăl* [Gr. *a*, without, and *sexual*]: having no distinct sex; applied to modes of reproduction of living creatures, in which the sexes are not concerned.

ASGARD, *ăs'gárd*: in Scandinavian Mythology (q.v.), the home of the gods. Odin and the other gods dwelt in the mansion Gladsheim, the goddesses in Vingulf. Warriors slain in battle lived here in Walhalla. Every day the gods assembled in council beneath the ash-tree Yggdrasil.

ASGILL, *ăs'g'il*, JOHN: an eccentric English *littérateur*; b. about the middle of the 17th c., d. 1738, Nov. He studied for the bar; but being addicted to writing political pamphlets, he soon became involved in pecuniary difficulties. Upon the passing of the act for the resumption of forfeited estates in Ireland, 1699, he went thither, found the whole country wrangling in lawsuits, secured a lucrative practice, and obtained a seat in the Irish parliament. But he had recently published an extraordinary pamphlet, entitled, *An Argument proving that, according to the Covenant of Eternal Life revealed in the Scriptures, Man may be translated hence into that Eternal Life without passing through Death, although the Human Nature of Christ himself could not thus be translated till he had passed through Death* (1700). The public flew into a rage against this absurd production; the Irish parliament voted it a blasphemous libel, and the astonished author was expelled from the house after four days. In 1705, A. returned to England, and entered the English parliament as member for Bramber, in Sussex. But the fame of his unlucky pamphlet haunted him perpetually: the English house, resolving to be not less virtuous than the Irish one, took up the treatise, condemned it to be burnt by the common hangman, as profane and blasphemous, and expelled A., 1707, Dec. 18. After this, he betook himself for a living to professional practice of a humble grade—still inditing pamphlets.

ASH.

ASH, n. *ăsh* [AS. *æsc*: Icel. *askr*]: a well known tree. ADJ. made of or pertaining to the ash; the *Fraxinus excelsior*, or common ash, ord. *Oleaceæ*. ASHEN, a. *ăsh'ên*, made of ash. ASH-KEYS, or ASHEN-KEYS, seed vessels of the ash-tree, called by botanists *samaras*, i.e., dry, indehiscent, winged, two-celled, two-seeded capsules. Their length and lateral compression make the resemblance to keys. The term is used in heraldry, the seed-vessels being occasionally represented on an escutcheon.

ASH (*Fraxinus*): genus of trees belonging to the nat. ord. *Oleaceæ*, and distinguished by very imperfect flowers, in which the calyx is obsolete, and the corolla either want-



Common Ash.

ing or 3-4-partite; the fruit is a *samara*, a seed-vessel foliaceous at the extremity. The leaves are deciduous, and are pinnate with a terminal leaflet. There are about fifty species, natives mostly of Europe and North America.—The COMMON ASH (*F. excelsior*) grows wild in the middle and s. of Europe and n. of Asia. It is an undoubted native of Britain. The flowers are quite naked; the leaves have five or six pairs of leaflets. The flowers appear before the leaves in spring, and the tree is not covered with leaves until the season is far advanced, losing them again early in autumn. It is, however, a most beautiful umbrageous tree, highly ornamental in parks; though extremely injurious to the grass or crops immediately around it. It rises to the height of 100-150 ft., generally with a smooth stem. The wood is white, tough, and hard, much valued by wheelwrights, cartwrights, coach-makers, joiners, and turners. It is also excellent for fuel. Sometimes it becomes irregular in the disposition of its fibres, and finely veined, and is then prized by cabinet-makers. The wood of the young trees is almost as valuable as that of the old. Indeed, the value of the timber is greatest in trees of which the growth has been rapid, as it exhibits the characteristic toughness in the highest degree. The A. prefers a loamy soil, but grows in almost any, and succeeds in situations too elevated or too exposed for most other trees. Cultiva-

ASH.

tion has produced and perpetuated a number of varieties, of which the most remarkable are the *Weeping A.*, with boughs bent almost straight down to the ground; the *Curled-leaved A.*, with dark-green wrinkled or curled leaves; and the *Entire-leaved A.*, a very curious variety, with many or all of the leaves simple (not pinnated), which has been erroneously regarded by some botanists as a distinct



Common Ash.

species, and named *F. simplicifolia*, *F. heterophylla* etc.—The SMALL-LEAVED A. (*F. parvifolia*) and the LENTISK A. (*F. lentiscifolia*) are both natives of the shores of the Mediterranean, and are very graceful and ornamental trees.—The AMERICAN A., or WHITE A. (*F. Americana*), is readily distinguished from the Common A. by its lighter bark and paler green leaves. The flowers have a calyx, and the leaflets are shortly stalked and entire (those of the Common A. being sessile and serrated). It is abundant in New Brunswick and Canada, but becomes rare to the s. of New Jersey. The trunk often rises more than 40 ft. undivided. The wood is used for the same purposes as that of the Common A.—The RED A., or BLACK A. (*F. pubescens*), is very similar, but of smaller size, and has a deep brown bark. It is most abundant in Pennsylvania, Maryland, and Virginia, especially in swampy ground.—The BLACK A., or WATER A. of the New England States, New Brunswick, etc. (*F. sambucifolia*), is a large tree with buds of a deep blue color.—The BLUE A. of Ohio, Kentucky, Tennessee, etc. (*F. quadrangulata*), is also a large tree. The branches are quadrangular, the young shoots having on the angles four membranes which extend their whole length.—The GREEN A. (*F. juglandifolia* = *viridis*), recognized by the brilliant green of its young shoots, is found

ASHAMED.

chiefly in the middle states; and the CAROLINA A. (*F. Carolina*), remarkable for the great size of its leaflets, chiefly in the southern states. Besides these, North America produces a number of other species or varieties. The wood of all of them is used for somewhat similar purposes to that of the Common A.—In the s. of Europe grows the MANNA A. or FLOWERING A. (*F. Ornus*, called *Ornus Europæa* by some botanists), whose flowers have a 4-partite calyx, and four small yellowish-white petals. The tree has much re



Common Ash.

a, a branch with leaves; *b*, flowers; *c*, fruit (on a considerably larger scale than the leaves and flowers).

semblance to the Common A. From it the substance called Manna (q. v.) is obtained by means of transverse incisions in the bark; but in very favorable situations, it flows spontaneously during the greatest heat of summer. Manna is chiefly collected in Calabria and Sicily. A nearly allied species, *F. rotundifolia*, a native of Greece and the Ionian Islands, yields it also in perhaps equal quantity. The Common A. is said sometimes to produce the same exudation in the same warm climates.

The MOUNTAIN A. is the Rowan Tree (q. v.), and belongs to a different nat. ord. Its resemblance to the A. is chiefly in its leaves.

The A. has a peculiar importance in Scandinavian mythology. The first man and woman formed were Ask and Embla (Ash and Elm). The court of the gods is represented in the Edda as held under an A., called Yggdrasil (q. v.). Connected, perhaps, with these traditions is the superstitious belief in A. twigs as a charm against witchcraft and magic.

ASHAMED, pp. or a. *ă-shāmd'* [AS. *ascamian*: Meso-Goth. *gaskaman*, to be ashamed: AS. *a*, on; and Eng. *shame*]: confused from a sense of guilt or unworthiness; covered with shame. ASHAM'EDLY, ad. so as to manifest shame; bashfully.

ASHANTI—ASHBURTON.

ASHANTI, or ASHANTEE, a former negro kingdom, now a Brit. protectorate, in w. Africa on the Gold Coast; lat. 5° – 9° , long. 0° – 4° w.; cap. Kumassi. A large part of the country is in forest; and the open land is very fertile, producing maize, millet, rice, yams, tobacco, sugar, cocoa, gums, dye-woods, and pineapples and other fruit. Drainage and limited communication are by the Volta, Prah, and Assinie rivers. Being shut in from the sea-board and having only a caravan route between Coomassie and Cape Coast Castle, A. has but little commerce, its exports being mainly gold-dust and palm-oil. The natives show skill in manufacture of cotton goods, earthenware, and sword-blades, but are still quite savage. It is believed that the establishment of the A. kingdom was made several centuries ago by an emigration from n. of the Kong Mountains. In 1700 Osai Tutu I. conquered Akim, Assin, Gaman, Denkira, and neighboring states, and made Kumassi his capital. During 1807–26 the people were involved in war with Great Britain and were driven from the sea-coast and the territory now forming a part of the Gold Coast Colony. In 1873–4 they were again at war with the English, concerning cession of the Dutch forts to Great Britain; and their capital was burned by Sir Garnet Wolseley 1874, Feb. 6. The king then renounced all claims on the protectorate of the Gold Coast Colony, promised to protect traders, and paid an indemnity to the Brit. govt. In 1876 the Ashantis defeated the Juabins, and the latter took refuge within the Brit. protectorate. After the burning of Kumassi the Brit. govt. did not attempt to assert territorial rights there till 1895–6, when another expedition took possession of Kumassi, forced the submission of the king, who with his chiefs was sent to Sierra Leone, and established a protectorate over the country. Pop. est., 1,000,000—3,000,000.

ASHBOURNE, or ASHBORNE, or ASHBURN, *ăsh'bŭrn*: market-town in a rich district near the left bank of the river Dove, in the w. of Derbyshire, 13 m. n.w. from Derby. Is lies in a fertile valley, amid beautiful scenery. The parish church is cruciform, dating from the 13th c., restored 1845. There are manufactures of cotton, lace, and iron. At A., 1644, the parliamentary troops defeated those of Charles I. Pop. (1881) 3,485; (1891) 3,810.

ASHBURTON, LORD (ALEXANDER BARING): 1774–1848, May 13: younger son of Sir Francis Baring, Bart. In early life he was for many years commercially engaged in the United States and the Canadas, in the service of the great London mercantile house founded by his father, at whose death, 1810, he became the head of the firm of Baring Brothers & Co. In 1812, he was elected M.P. for Taunton; representing that place, Callington, and Thetford, in the liberal interest, till 1831, and in 1832 was returned for North Essex as a moderate conservative. In the short administration of Sir Robert Peel (1834–35), he was pres. of the board of trade, and master of the mint, and was made Baron A. by patent, 1835, Apr. In 1842, Lord A. was appointed special ambassador to the United States, to settle the n.w. boundary question, and other dis-

ASHBURTON--ASHERA.

putes threatening war; and in Aug. of that year, he concluded the famous treaty of Washington, commonly called the A. treaty, establishing by definite agreement the frontier line between the state of Maine and Canada. By this treaty seven-twelfths of the disputed ground, and the British settlement of Madawaska, were given to the United States; but it secured a better military frontier to England, and included heights commanding the St. Lawrence, which the award of the king of Holland, who had been chosen arbiter, had assigned to the Americans. By the 8th and 9th articles, provisions were made for putting an end to the African slave-trade; and the 10th article provided for the mutual extradition of suspected criminals. Lord A. opposed free-trade, but strongly supported the penny-postage system when first proposed by Rowland Hill in 1837. His eldest son, William Bingham Baring, Lord A., 1799-1864, was educated at Oriel College, Oxford, entered parliament, 1836, as member for Taunton; was appointed sec. to the board of control, 1841, Sep.; and became paymaster-gen. of the forces, and treasurer of the navy, 1845, Feb.

ASHBURTON: small town in the s. of Devonshire, consisting mainly of two paved streets crossing each other. The business is mining, slate quarrying, and serge manufacture. Pop. abt. 3,000.

ASHBY-DE-LA-ZOUCH, *āsh'bē-dēl-a-zōch'*: small town near the source of the Mease, tributary of the Trent, in the n.w. of Leicestershire. Leather-making is the principal manufacture. In the neighborhood are collieries, and saline springs containing common salt in greater proportion than the sea; also ironstone, and fine clay. A canal 30 m. long, without a lock, connects the town with Coventry. The ruins of A. Castle stand on a height s. of the town. Mary Queen of Scots was once confined in this castle. St. Helen's Church, an ancient structure with a tower, is the burying-place of the Hastings family, as well as of Selina, Countess of Huntingdon, the founder of the sect called the Countess of Huntingdon's Connection. Pop. of A. (1891) 4,535.

ASH-COLORED, *a.* [see **ASHES**]: colored between brown and gray, like ashes.

ASHDOD: see **AZOTUS**.

ASHE, *āsh*, **JOHN**: patriot: 1720-1781, Oct. 24; b. Grovely, N. C. He served several terms in the colonial assembly, opposed the enforcement of the Stamp Act, and led the force which destroyed Fort Johnson 1775. He was a delegate to the first congress of the province, organized a regt. of troops and paid the expense of its equipment, became brig.gen., made an unsuccessful attempt to take Augusta from the British, and was taken prisoner at Wilmington 1781. His death resulted from small-pox, and from cruel treatment by his captors.

ASHERA, *n.* *āsh'ēr-ā* [Heb.]: the word translated 'grove,' in the Old Test. Scriptures, but it appears to have been only a pole of wood, or a stem of a tree, set upright on a circular altar as an object of worship. See **PHALLUS** and **LINGA**. --

ASHES—ASHEVILLE.

ASHES, n. plu. *ăsh'ĕz* [AS. *asca*, or *asce*: Icel. *aska*: Goth. *azgo*: Ger. *asche*, dust, refuse]: the dust or matter that remains from a burnt body; the remains of any body reduced to dust. **ASH**, sing. a variety of ash, as in cinder-ash, or tobacco-ash; often used for *ashes*, as in *potash*. **ASHY**, a. *ăsh'ĭ*, pale; like ashes. **ASH'ERY**, n. *ăsh'ĕr-ĭ*, an ash-pit. **ASH'Y-PALE**, pale as ashes. **ASH WEDNESDAY**, (q.v.), the first day of Lent. **ASH-FIRE**, the subdued or low fire used in chemical furnaces.

ASHES: remains of animal and vegetable bodies after burning. It is not strictly correct to speak of the A. of a mineral. When lead, for instance, is exposed to heat, it turns to dross, which has the appearance of A., but is merely the lead combined with oxygen. In the same way, volcanic A., as they are called, are only a finer kind of pumice-stone, the solidified scum of molten lava. The A. of organic substances destroyed by fire consist of the fixed salts contained in these substances. In land-plants, the most important are salts of potash, with silica and lime; in sea-plants, soda takes the place of potash. By lixiviation of the A., the potash or soda is dissolved and separated from the insoluble mass, and is then purified by crystallization. The A. of sea-plants contain also more or less iodine. Peat and turf A. contain, besides alkalies, more or less clay and sand; the same is true of pit-coal, which sometimes contains iron.

Formerly A. or the inorganic ingredients of plants were considered unessential to their existence, but chemistry has taught that a certain proportion of mineral food is absolutely necessary to their development.

The A. of animals are similar to those of vegetables. Bone A. consist largely of lime and phosphoric acid, and are a valuable fertilizer. In timbered countries wood A. are an article of considerable trade. They are used in various arts, e.g., soap-boiling, bleaching, dyeing, and glass-making; for manufacture of potash, and for promoting growth of plants (see **FERTILIZERS**), to which they supply potash, carbonate of lime, phosphoric acid, and a little magnesia. They are useful also in making available for plants stores of nitrogen which the soil contains, or which it supplies only in forms not readily assimilated.

The covering of the head with A. has long been a common sign of mourning among eastern nations, indicative of the very deepest distress. Instances of this are mentioned in Scripture. Penitents in the early Christian Church signified their sorrow and humiliation in like manner, by standing at the door of the church in 'sackcloth and ashes.' See **ASH-WEDNESDAY**.

ASHEVILLE, *ăsh'vĭl*: cap. of Buncombe co., N. C.; on the East Tennessee Virginia and Georgia and the Western North Carolina railroads; near French Broad river; 125 m. w. of Charlotte, 275 m. w. of Raleigh. There are five churches; three academies and a female college; two daily, two weekly, one semi-monthly, and two

ASHFORD—ASHLAR.

monthly papers; two national and two state banks (combined cap. \$320,000); and several hotels. It is in a large tobacco-growing district, and has four factories in which this product is prepared for market. There are an iron foundry, a planing-mill, and various other industries, as well as important trade with the local district, and quite an export trade in tobacco. The location is pleasant, on the w. side of the Blue Ridge, about 2,500 ft. above sea-level; and the river is crossed by a fine iron bridge. The elevation, fine scenery, and pure air have made A. an attractive health resort. Pop. (1880) 2,616; (1890) 10,235; (1900) 14,694.

ASHFORD, *ăsh'fôrd*: town on the w. of the confluence of the two upper branches of the river Stour, near the middle of Kent. Damask is manufactured here. Pop. (1891) 10,728, which has largely increased from its having become the junction station of three great lines of railway.

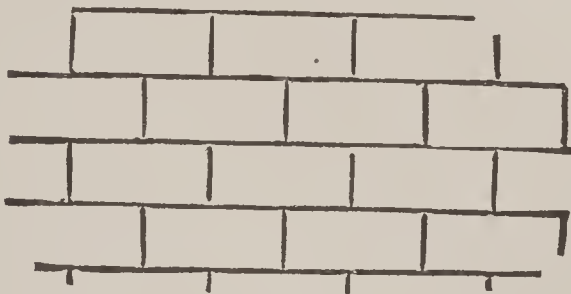
ASHLAND, *ăsh land*: town, Schuylkill co., Penn.; in the Mahanoy valley; on the Lehigh Valley and the Philadelphia and Reading railroads; 12 m. from Pottsville, 119 m. n.w. from Philadelphia. It has 11 churches; a state hospital for miners; about 20 schools; one daily and three weekly newspapers; a national bank (cap. \$60,000); an opera-house; and several hotels. The town is lighted by gas, and electricity, and has waterworks and a public park. There are immense coal mines, large machine-shops, foundries, planing-mills, flour-mills, and manufactures of various kinds. Many of the people are of foreign birth. Pop. (1890) 7,346; (1900) 6,438.

ASH'LAND: city, cap. of Ashland co., Wis.; on Lake Superior, and on the Wisconsin Central, the Chicago St. Paul Minneapolis and Omaha, the Northern Pacific, and the Lake Shore and Western railroads; 80 m. e. of Duluth. It has an excellent harbor, sheltered by the Apostle Islands; is the lake-port for export of all the ore produced in the rich Gogebic range; is connected by steamers with all lake-ports, and by excursion-boats with Washburn and Bayfield; is a favorite summer resort. and has the largest charcoal blast-furnace in the world, 3 of the largest ore docks in the country; 8 lumber wharves; gold and silver smelting-works; 2 opera-houses; 8 saw-mills; street railroad; govt. land office; gas and electric light plants; 3 national banks (cap. \$325,000) and 1 savings bank; Vaughn Public Library; 11 churches; 2 daily and 5 weekly newspapers; valuation 1892, \$6,605,560; and debt \$216,000. Pop. (1890) 9,956; (1900) 13,074.

ASHLAR, or ASHLER, n. *ăsh'lér* [OF. *aiseler*; Scot. *aislair*, hewn stone—from F. *aisselle*, the arm-pit, the hollow between a branch and the stem of a tree—from L. *axilla*, the arm-pit: It. *asciare*, to cut or hew with an ax]: rough-hewn stones used for facing walls, as distinguished from rubble or rough stones which are used as they come from the quarry without being dressed; free or common stone roughly dressed with tools to fit on one another in courses without packing. A. is laid usually in regular courses in

ASHLEY—ASHMUN.

building, and is of various kinds, according to the style of working that side of the stone which is to form the facing



Ashlar.

of the wall. Thus, there are *tooled* A.—the marks of the tooling being either *random* or in *grooves*; *polished* A., in which the face of the stone is rubbed smooth; and *rustic* A., in which only the joints are accurately hewn, the face of the stone being left projecting irregularly. Quarriers apply the term A. to squared stones before being hewn. ASH'LERING, n. in *carpen.*, the fixing of short upright quarterings between rafters and the floor. In old documents, the term appears under a variety of forms, such as achlere, ashelar, aslure, and estlar. *Note.*—Skeat traces OF. *aisselle*, in the sense of 'a little plank,' to mid. L. *assella*, a dim. of *assis*, a board, houses being formerly erected with a facing of planks, and the name was finally transferred to the facing with rough hewn stone.

ASHLEY, LORD: see SHAFTESBURY.

ASHMEAD-BARTLETT, WILLIAM LEHMAN; b. New Brunswick, N. J., 1851; son of an Eng. non-conformist minister. He was educated at Oxford Univ. Through his mother's acquaintance with Baroness Burdett-Coutts (q.v.) he became her protégé, and later her private sec. In 1881, Feb. 12, he married the baroness, 37 years his senior, who, by this marriage, surrendered part of her immense fortune. A. was elected to parliament, and re-elected 1886 and '92, sitting for Westminster. By royal license he assumed the name Burdett-Coutts.

ASH'MOLE, ELIAS: 1617, May 23—1692, May 18; b. Lichfield, Eng.; lawyer and author. During the civil wars he was a royalist cap.; at Oxford, he applied himself to the sciences and astrology. In 1652 he issued *Theatrum Chymicum Britannicum*, which procured for him a high reputation, and (1658) *Way to Bliss*, a work on the philosopher's stone. In 1682, he gave the Univ. of Oxford "The Ashmolean Collection" of rarities which had belonged to John Tradescant.

ASH'MUN, JEHUDI: 1714—1828, Aug. 28; b. Champlain. N. Y.: American philanthropist. He was educated for the Christian ministry; but eventually, as editor, author, and agent, became an advocate and helper of the African Colonization Soc. for founding a colony of liberated negroes on the w. coast of Africa. See LIBERIA. He conducted a body of liberated negroes from Baltimore, and landed at Cape Mesurado, the seat of the infant colony, in autumn, 1822. Dr. Ayres and the other agents of the society having meanwhile abandoned the settlement from severe illness, he assumed the superintendence of affairs as the sole representa-

ASHOCA—ASH-WEDNESDAY.

tive of that body; and for more than six years, he gave himself with great courage, tact, and ability, to establishing the infant colony of Liberia. His health failed; he returned to the United States, and died soon afterwards. A memoir of his life, by R. R. Gurley, appeared at Washington, 1835.

ASHO'CA: see ASOCA.

ASHORE, ad. *ă-shōr'* [AS. *a*, on, and *shore*]: on shore; on the land.

ASHTABULA, *ăsh'ta-bū'lá*: t. in Ohio, in township and county of the same name; on both sides of Ashtabula river, near its mouth; 54 m. from Cleveland, 3 m. from Lake Erie; on the Ashtabula, Youngstown and Pittsburgh, and the Lake Shore and Michigan Southern railroads. It was laid out, 1837. A. contains three banks (one national), 2 newspaper offices, and 6 churches. Its manufactures comprise a rolling-mill, machine shop, 2 shaft factories, and 2 manufactories of sashes, blinds, and doors. Pop. (1880) 4,445; (1890) 8,316; (1900) 12,949.

ASH'TON-IN-MACKERFIELD: township in a carboniferous district, in the middle of South Lanchashire. Pop. (1881) 9,825, chiefly engaged in collieries, and in the cotton manufacture; (1891) 13,379.

ASH'TON-UNDER-LYNE: town in the s. e. of Lancashire; a great seat of the cotton manufacture. The population is employed also in bleaching, dyeing, and calico-printing, in collieries, and in the manufacture of machines, bricks, etc. A. returns one member to parliament. To the w. is a large moss or shaking bog, containing fir-trees full of turpentine, and black oak, with a loamy bottom at the depth of 10 ft. Pop. (1871) 37,389; (1881) 43,389; (1891) 40,494.

ASHTORETH, n. *ăsh'tō-rěth* [Gr. *astar'tē*: in Phœnician, the wife of Baal]: a goddess of the ancient Sidonians and Philistines, identified with Venus of the Romans; Astarte. ASH'TAROTH is the plu. form of *Ashtoreth*. See ASTARTE.

ASH-WEDNESDAY: first day of Lent (q.v.), so called from the Rom. Cath. ceremony of strewing ashes on the head as a sign of penitence. This custom, introduced probably by Gregory the Great (590–604), was sanctioned by Pope Celestin III, 1191, and afterwards generally prevailed. Before mass, the ashes were consecrated on the altar, sprinkled with holy water, and signed three times with the cross, while the priest recited the words, *Memento quia pulvis es, et in pulverem reverteris!* ('Remember that thou art dust, and must return to dust!') Next, they were strewed on the heads of the officiating priests, the clergy, and the assembled people. The ashes were said to be those of the palms consecrated on the preceding Palm Sunday (q.v.)—The Protestant Church in Germany does not observe A. In the Church of England, it is observed by the stricter members, but only as a day of penitential service, without anything of the ceremony from which it derives its name; and the *commination*—a series of denunciations against impenitent offenders—is appointed to be read in the service of this day.

ASIA.

ASIA, *ā'shī-a* : largest division of land on the globe, generally regarded as the birthplace of the human race, and the most ancient seat of civilization. Its superficial area, including islands, has been estimated at from 16 to 20,000,000 sq. m., and its population at 840,000,000. This enormous continental mass lies almost entirely in the n. division of the e. hemisphere, while its world of islands extends across the equator on the s.e. On three sides, it is surrounded by the ocean ; but on the w., is partially connected with Africa and Europe. The continent is more than four times as large as Europe. Some idea may be formed of its vast extent by the calculation that, though it contains more than half of the whole population of the globe, the number of its inhabitants is so small compared with its area, that Europe may be said to be three times more densely populated. The coast-line is about 33,000 m. in length ; and on the s. and e., is diversified by seas, bays, and gulfs, affording advantages to navigation and commerce far superior to those of Africa, but inferior to those possessed by Europe and America. On the w. side, the Dardanelles and the Sea of Marmora may be regarded as but a slight interruption of the great table-lands of Europe and A. which form the continent of the old world.

Horizontal Configuration.—A. is bounded n., by the Arctic Ocean ; e., by the Pacific Ocean ; s., by the Indian Ocean ; and w., by Europe, the Black Sea, Archipelago, Mediterranean, and the Red Sea. On the extreme n.e., the peninsular land of Kamtchatka is separated from North America only by the narrow Behring's Strait. On the s.e., a bridge of numerous islands—Sumatra, Java, Borneo, Papua, etc.—extends towards Australia. The body of the continent may be regarded as a trapezium, of which the offsets, consisting of several large peninsulas, bear some resemblance to those of Europe ; though in A. everything is on a more gigantic scale. Thus, one of these offsets, the peninsula of Arabia, is four times as large as France. On the w. extends the peninsula of A. Minor or Anatolia, divided from Europe by the Strait of Constantinople, the Sea of Marmora, and the Dardanelles, with the Black Sea on the n., and the Levant on the s. On the s. of A., the peninsular configuration may be divided into three principal masses, corresponding to the s. coast of Europe ; Arabia may be considered as a counterpart to Spain ; Italy, with its neighbor-island, Sicily, is represented by Hindustan and Ceylon ; and, as in Europe, the broken Grecian peninsula is connected with A. by a bridge of numerous islands extending on the s.e., so in A., the Eastern Peninsula (or India beyond the Ganges), lying between the Bay of Bengal and the Chinese Sea, is connected with Australia on the s.e. by the vast Eastern Archipelago. This world of islands is divided into the several groups of the Philippine Islands, Borneo, Celebes, Molucca Islands, Sumatra, and Java, Timor and the numerous adjoining isles. The e. coast of A. is characterized by the deep indentations of the Pacific Ocean in the Chinese Sea, Yellow Sea, and Sea of Japan, Okhotsk,

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and Kamtchatka; all fringed with numerous islands, and separated by the peninsula of Corea, the island of Saghalien, and the peninsula of Kamtchatka. On the n., the Siberian coasts are also deeply indented; but rather by the embouchures of large rivers than by arms of the sea. The whole length of continental A., from the Dardanelles to the Japan Islands, is 6,000 m.; its breadth, from Malacca to the n.e. cape of Siberia, is 5,300 m.; with its islands it extends from 10° s. lat. to 78° n., and from 26° e. long. to 190° e. or 170° w. Such an extent of surface must include all varieties of soil, climate, and production.

Vertical Configuration.—Equally grand are the features of this continent when regarded vertically: it has the most extensive lowlands, the most immense table-lands, the highest chains of mountains, and the most elevated summits in the world; tracts doomed to everlasting snow or scorching sterility, salubrious valleys of continual verdure, and noisome jungles of the rankest growth. The table-lands of Asia occupy two-fifths of the whole continent. The eastern extremity is 2,000 m. broad; the western, less than 1,000. The whole mass may be regarded as consisting of two parts, separated, or, to speak more properly, perhaps, connected by the lofty, snow-covered mountain-isthmus of the Hindu Kush. These great divisions are styled respectively: 1. The Eastern Plateau, including the Table-land of Tibet and the Desert of Gobi; 2. The Western Plateau, or Table-land of Iran. The former, a vast four-sided mass, considerably larger than the whole area of Europe, extends 2,800 m. from the mountain chain, Hindu Kush, to the Tonquin Gulf in China. On the south, the plateau is divided from the plains of Hindustan by the Himalaya Mountains, which have a mean height of 18,000 ft., while several of their summits rise 25,000–29,000 ft. above the level of the sea. Even the passes over this enormous range of mountains are almost as high as the summit of Mont Blanc. Here Dhwalagiri, long supposed to be the Mont Blanc of the Himalayas, and with precisely the same signification, viz., ‘white mountain,’ rising to 26,826 ft., leaves all the peaks of the Andes far below; while Kunchinjunga reaches to 28,156 ft., and Mount Everest, now believed to be the loftiest summit in the world, attains the height of 29,002 ft. Cultivation is found at 10,000 ft. above the sea; while flocks graze some 4,000 ft. higher. In Eastern Tatar and Tibet, the ground is cultivated at a height only 2,000 ft. lower than the summit of Mont Blanc. On the e., the table-land of Tibet is bounded by the Chinese mountain-ranges Yun-ling and Khing-khan, which, towards the s., are connected with wild Chinese alpine regions of which little is known; while, towards the n., they extend into another mountainous region, where the eastern chain of Shangpe-shan opposes to the Pacific Ocean a wall of rock 3,000 ft. high. On the north, the chain of the Altaï Mountains, 3,000 m. long, and divided into several groups, forms the boundary between the great plateau and the plain of Siberia, which is larger than the whole of Europe.

The Western Plateau, or Table-land of Iran, rises genei-

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ally about 5,000 ft. above the sea; but in some parts to 7,000 ft.; descending, however, to 2,000 and 1,200 ft. in the central and southern parts, where it spreads out into sandy and gravelly plains. It has been divided into three sections: the Plateau of Iran proper; the Median-Armenian Alpine region; and the Anatolian Table-land. The *first* division, or the Plateau of Iran, has a mean altitude of about 3,000 ft. Salt plains, with gravel and sand, form large portions of the surface, and mountain-walls on all sides hem it in. On the n. edge stand the Persian mountains; on the e. are the steep and lofty parallel chains of the Indo-Persian boundary mountains; and on the s., the plateau, for 1,000 m. along the Persian Gulf and Arabian Sea, is bounded by the wild terraced regions of Beloochistan and Farsistan. The *second* division, or the Median-Armenian Alpine region, includes the mountainous regions of Armenia, Kurdistan, and Azerbaijan. Here the table-land is compressed to about half its general width. From this plateau, of which a part is mentioned in Scripture as 'the mountains of Ararat,' rises the volcanic cone commonly styled Mount Ararat, to the height of 17,212 ft. above the sea. Anatolia, the *third* and most westerly division of the table-land, is bounded along the shores of the Black Sea by mountains rising to 6,000 or 7,000 ft., and partly covered with forests; on the s.w., the Taurus chain of mountains, beginning in the islands of Rhodes, Cos, etc., extends in several ramifications through a part of Asia Minor, runs in a single range along the coast of Karamania, and in the e. has an occasional height of 12,000 and 13,000 ft.

The Western Plateau, thus divided into three sections, is full of diversities of soil and scenery. A great part of the table-land of Iran (or Persia) is extremely barren and arid, which serves to explain the enthusiastic terms in which the Persian poets have spoken of the beautiful valleys here and there among the mountains. The coasts of the Persian Gulf are sandy wastes. Between Irak and Khorassan, a desert of clay, covered with salt and nitre, varied only by patches of verdure here and there, occupies 27,000 sq. m., and joins the wide sandy desert of Kerman. A great part of Beloochistan is an arid plain, covered with red sand.

Besides these central masses, there are several detached mountain chains and plateaus. The Ural Mountains, forming the land-boundary between Europe and Asia, and separated from the Altaï chain by salt lakes, marshes, and deserts, are divided into three sections: the Northern, Central, and Southern Ural. The second of these divisions is rich in minerals—gold, platina, magnetic iron, and copper. On the isthmus between the Black Sea and the Caspian, the alpine ridges of the Caucasus reach a height of from 10,000 to 11,000 ft., while individual peaks tower 17,000 or 18,000 ft., as, in the still faintly volcanic peak of Elbruz (18,493 ft.) and Kasbeck (16,523)—both, however, on the n. or European side of the main mass of the Caucasus. The high lands of Syria rise gradually from the neighboring deserts to the height of 10,000 ft. in Libanus and Antilibanus, and slope steeply in terraces

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down to the narrow coast-lands of Phœnicia and Palestine. The plateau of the Deccan, in India, rises to an average height of from 1,500 to 2,000 ft., and is divided on the w. from the narrow coast-level of Malabar by the Western Ghauts, 4,700 ft.; on the e., from the broad level coast of Coromandel, by the Eastern Ghauts. On the n., it is divided from the low plains of Hindustan by the Vindhya and Malwah mountain-chains; and, on the s., the Ghauts unite at the sources of the Caverry, and form the Neilgherry (or Blue Mountains, 8,760 ft. high), the loftiest in the peninsular portion of Hindustan. These slope steeply down to a low narrow plain, then rise again to a considerable height in the Aligherry range, sink into the sea at Cape Comorin, and reappear in the group of Adam's Peak in Ceylon. The Malayan Mountains, or chain of the Eastern Peninsula, may be regarded as offsets of the Siue-shan, and extend to the extreme s. point of A., reappearing with volcanic peaks in the Sunda Islands.

The six great *Lowlands* of A. are, 1st, The *Siberian* lowland in the n., by far the largest. It stretches from the n. declivities of the Altaï and Ural Mountains to the shores of the Arctic Sea, and is, for the most part, cold, gloomy, and barren. 2d, The *Bucharian* lowland, or the wild sterile waste between the Caspian Sea and Lake Aral, much of it beneath the level of the sea. It is composed to a large extent of gravelly soil. 3d, The *Syrian and Arabian* lowland, the s. of which is hot and arid, with almost no oases; but the n. is watered by the Tigris and Euphrates. 4th, The lowlands of *Hindustan*, comprising the great Indian desert, 400 m. broad, together with the vast and fertile plains of Bengal, generally called the Valley of the Ganges, and ranking, perhaps, next to China as a region of fertility. 5th, The *Indo-Chinese* lowlands, comprising the long levels of the Burman empire, through which flows the Irrawady, and the rich regions of Cambodia and Siam. 6th, The *Chinese* lowlands, commencing in the e. at Pekin, and extending as far s. as the tropic of Cancer, containing 210,000 sq. m., an area seven times the size of Lombardy. It is watered by a copious river-system and numerous canals, and may be regarded as a vast garden, exceeding in productiveness all other parts of the world.

Hydrography. — The hydrography of A. displays as striking a variety as the structure of its land. The alpine regions send down in some directions torrents of water, which form rivers almost rivalling in magnificence those of America, and which flow for hundreds of miles through plains of unsurpassed fertility. On the other hand, there are wide-stretching tracts, like the deserts of Africa, destitute of water, and doomed to eternal sterility. Only one large sheet of water, Lake Hamoon or Seistan (q.v.), refreshes the high table-land of Iran. The low steppe of Turan contains the Caspian Sea (q.v.), the largest of all lakes, and Lake Aral (q.v.). In the valley of Cashmere lies Lake Ular, 40 m in circumference, and the only considerable sheet of water in the Himalaya chain. At the

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n. base of this mountain chain, Lake Palte is remarkable for its annular form. In Tibet and the Altaï Mountains, lakes are very numerous.

One of the most striking characteristics of Asian river-systems is found in its double rivers, or two streams rising in the same region, flowing in almost parallel directions, and either uniting, or nearly so, before entering the sea. Among these twin rivers may be mentioned—the Syr-Daria and Amu-Daria, flowing into Lake Aral; the Euphrates and Tigris, in Western A., surrounding the plain of Mesopotamia, uniting at Koonah, and together flowing into the Persian Gulf; the Ganges and Brahmaputra; and the Yang-tse-kiang and Hoang-ho, in China, rising near each other, then widely separated in their courses, but again approaching each other, and both falling into the Yellow Sea, only 100 m. apart.

The six great river-systems of A., comprising rivers (see their respective titles), are—the Mesopotamian, that of Northwest India, that of Northeast India and Tibet, the Indo-Chinese, the Chinese, and the Siberian. The *first* comprises the two famous streams, the Tigris and Euphrates. The *second* comprises the Indus with its tributaries. The *third* comprises the Brahmaputra and Ganges. The *fourth* comprises the rivers of the Indo-Chinese peninsula; the chief of which are the Irrawady, the Martaban or Saluen, the Me-nam, and the Me-king or Cambodia. The *fifth* system is the Chinese, comprising four great streams, all of which flow in an e. or n. direction into the Pacific; the Hong-kiang, or Canton river; the Yang-tse-kiang (or Son of the Sea); the Hoang-ho, or Yellow river; and the Amur. The *sixth* comprises the large rivers of Siberia, the principal of which are the Obi, the Yenisei, and the Lena. They all have their sources in the Altaian Mountains; flow n., or nearly so; and for 800 or 900 m. before their embouchure, traverse a dreary, flat, monotonous waste, until their sluggish waters creep into the Frozen Sea.

Geology.—The geological structure of Asia is so complex, the different formations are so broken up and scattered, that a general description would be unintelligible. For the geological structure and phenomena of circumscribed districts, needful to a correct impression of the geology of Asia as a whole, see the separate titles. See INDIA: CHINA: TIBET, etc.

Natural History.—The vast extent of A., and its great diversities of climate, naturally lead to the expectation of a great variety of natural productions, both animal and vegetable. This expectation is heightened, by considering how completely this vast continent is divided into separate portions by mountain-ranges of great altitude, and how extensive the mountainous tracts themselves are, as well as the great extent of the elevated plateaus or table-lands, and when we add to these considerations that of the peculiar character of wide regions—wastes of sand—level steppes—and extensive districts of which the soil is strongly impregnated with salt. Accordingly, in both the flora and fauna of Asia, an immense variety appears.

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The most northerly part of the continent, however, differs comparatively little in its productions from the corresponding parts of Europe and America. It exhibits the same arctic flora, with differences comparatively inconsiderable. Pines, birches, and willows form, as in the other continents, the last forests of the north; but upon account of the more severe climate, they do not reach a limit so northerly as in Europe, and particularly in the w. of Europe. Some of the common plants of Europe are abundant as far east as Kamtchatka: the Crowberry (*Empetrum nigrum*), so plentiful in the moors of Scotland, is still more plentiful throughout Siberia; the same *Vaccinia* (bilberries, etc.), and *Rubi* (brambles, etc.) abound in the Kamtchatkan forests as in those of Scandinavia. There are, however, interesting differences. Heaths are comparatively rare in Asia, its flora agreeing in this respect with that of America, rather than with that of Europe. The larch, which in Europe occurs only on the central mountains, extends far northward at the mouth of the Obi to the utmost limits of arborescent vegetation; probably a mere variety of the same species, although it has been described as distinct. In Kamtchatka, a different kind of birch replaces the common birch of Europe as a forest tree, and the Siberian stone pine is different from that of the s. of Europe. Siberia in its less frigid regions produces a luxuriant vegetation, of which herbaceous plants of unusually large size for a cold or temperate climate are a characteristic feature; as species of Rhubarb, Angelica, and Cow-parsnip (*Heracleum*), some of which are now well known in Britain. It is indeed from the central and eastern temperate parts of Asia that the cultivated species of rhubarb are derived, and from the same region the rhubarb root, valuable in medicine, is brought. In the abundance of *Grossulariaceæ* (currants), the warmer parts of Siberia resemble North America, though most of the species are different.

To the s. of the Altaian Mountains, the flora of Asia corresponds in part with that of the great eastern plain of Europe; but it exhibits also peculiarities which may in some measure be ascribed to the saline character of large districts, the stony or sandy desolation of others, and the elevation of the great central plateau. The flora of Asia Minor and of Syria has a general resemblance to that of the s. of Europe, although with features also which belong rather to that of India or of Africa. Shrubby *Labiatae* are particularly characteristic of this region, from which not a few of them have found their way into the gardens of Europe and of other parts of the world, on account of their fragrance, their medicinal qualities, or their use for the grateful seasoning of food.—The tropical flora of Arabia abounds in trees which yield fragrant balsams and resins, particularly of the nat. ord. *Amyridaceæ*. Indeed, both the warmer temperate and the tropical regions of Asia excel other parts of the world in the number and variety of the odoriferous drugs which they produce, with odors of the most various characters, from myrrh and frankincense to asafetida. Arabia has long been noted for the production of coffee,

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now extensively cultivated in other warm parts of A. The date-palm is as characteristic of Arabia as of Egypt. Acacias and mimosas also abound.—The flora of Persia in part resembles that of Arabia, though it is less tropical, and the height of its mountains gives it in some places a very different character.—The abundance of *Scitamineæ* is regarded as particularly characteristic of India; and plants of this order yield ginger, galangal, cardamoms, turmeric, and other articles of commerce, among which not the least important is a kind of arrow-root. Its *Leguminosæ* are also very numerous, both herbaceous and shrubby, or arborescent, many of them exhibiting great beauty of foliage and splendor of flowers; some producing useful kinds of pulse; others timber, gum, medicines, etc. The number of valuable medicinal plants which belong to the Indian flora is very great, as is also that of dyewoods; and it abounds in fine fruits, of which the mango and mangosteen may be particularly noticed. *Cucurbitaceæ* (gourds) are very numerous; as are also trees of the genus *Ficus* (fig), some of which produce caoutchouc, and among which are the sacred peepul and the banyan-tree, remarkable for the roots which descend from its branches to become new stems, and for the extent of ground which it canopies. Palms are numerous in the tropical parts of A., and particularly in its s.e. regions, but less numerous than in the tropical parts of South America. The cocoa-nut is one of the most common palms in the vicinity of the sea. Some of the Asiatic palms are valuable for the sago which they yield. The nat. ord. *Dipteraceæ* is one of those that are peculiar to India and southeastern A., and includes some of the noblest timber-trees; but the Indian teak, so valuable for shipbuilding, is of the order *Verbenaceæ*. The flora of the Eastern Peninsula, Siam, Cochin-China, and the s.e. of A. generally, differs considerably from that of India, and exhibits, if possible, a richer variety. The change from the Indian flora is still greater in the islands, and a resemblance to that of Polynesia and of Australia begins to appear. The bread-fruit takes the place of its congener, the jack of India. These regions produce nutmegs, cloves, and other spices. The *Lauraceæ* are abundant, yielding cinnamon, cassia, and camphor. Gutta serena has recently been added to the number of the most valuable exports. China and Japan have many plants peculiar to themselves, and are remarkable for the prevalence of the *Ternstroemiaceæ*, the nat. ord. to which the tea-plant and the camellia belong. It is scarcely necessary to mention how extensively tea is cultivated in China, and how important it is in the commerce of the world. The diversity of climate, however, both in China and Japan, is so considerable, as to imply no small diversity of productions. In like manner, the Himalaya Mountains have a flora very different from that of the Indian plains, and which in some of its most characteristic features, particularly in the prevalence of large rhododendrons and magnolias, has been found remarkably to agree with the flora of the southern part of the United States; while at still greater altitudes there is a strong resemblance to that of

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more northern regions, or of the European Alps; forests of pines appear, and with them the *deodar*, a cedar scarcely, if at all, different from the cedar of Lebanon. The mountains of Java produce oaks and other trees resembling those of the temperate zone, although the species are peculiar. But many parts of A. have as yet been very imperfectly explored.

Many of the cultivated plants of Europe are known to be natives of A., and others are supposed to be so. As the cradle of the human race, and the scene of the earliest civilization, it is natural to suppose that it supplied the first fruits and other vegetable productions which man sought to improve by cultivation; and of some which, as the apple and the cherry, are probably natives of Europe, it seems probable that the first improved varieties were introduced from A. We do not know with certainty of what part of the earth some of the principal cereal plants or grains are natives—as wheat, barley, oats, and rye; but there seems great probability in the supposition that they are of Asiatic origin. Rice certainly is. It has been cultivated from time immemorial in some of the warm parts of A.; and its introduction into other quarters of the world is comparatively recent. Maize—introduced from America—is now to be reckoned among the most important cultivated plants of A., and its cultivation is rapidly extending, as is that of the potato. Wheat, oats, barley, rye, beans, pease, and buckwheat are the principal crops of regions similar in climate to those in which they are cultivated in Europe and America. Barley and buckwheat are cultivated in the Himalayas at the extraordinary elevation of almost 12,000 ft., and crops of barley are to be seen even 15,000 ft. above the sea. Millet of different kinds, durra, and other grains of inferior importance, are cultivated to some extent in India and other warm regions; also different kinds of pulse. The banana and plantain are of the same importance as in other tropical countries; and the yam and cocco or eddoes contribute largely to the supply of human food. The sugar-cane is cultivated in the warm parts of A., but not with so much spirit or success as in America, although it is a native of the East and not of the West Indies. Pepper is one of the native productions of the East Indies, and is extensively cultivated. Tobacco, whether or not any species of it is indigenous to A., is now produced in large quantities. Indigo is extensively cultivated in India, and the opium poppy too extensively. Different species of cotton are natives of India, and have long been cultivated there and in China. Hemp is cultivated in India, not for its fibre, but to afford the means of intoxication; and flax chiefly for the oil of its seeds; but both hemp and flax are extensively cultivated for their fibres in other parts of A.; and India and the other tropical regions produce many plants valuable for their fibres, among which are species of *Musa*, *Corchorus* (yielding the jute of commerce), and *Urtica* (nettle). Among the crops of India is sesamum, valued for the oil of its seeds.

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It seems probable that we are indebted to the warmer temperate parts of A. not only for the orange, the lemon, and all the other species of the genus *Citrus*, but also for the olive, the peach, and nectarine, the apricot, the fig, the mulberry, and the vine, with many other of the fruits now most generally esteemed and cultivated. China and Japan being the seats of an ancient civilization, many useful plants have long been cultivated there, which have scarcely yet found their way into other parts of the world. Floriculture has been practiced there with great assiduity from a remote antiquity; and varieties of *Hydrangea*, *Camellia*, Tree Peony, *Chrysanthemum*, etc., have from time immemorial been scarcely, if at all, less numerous than those of the Tulip and Hyacinth in Holland.

The zoology of A. is not less interesting than its botany. Among domestic animals, the most important are the ox and buffalo, the sheep, the goat, the horse, the ass, the camel, and the elephant. A number of species of ox and buffalo are natives of A., from more than one of which the domesticated races appear to have derived their origin. Very distinct from all the others is the yak (q.v.) of Tibet, a creature which is of great use to the inhabitants of the elevated regions of the Himalayas, and is to them almost what the reindeer is to the Laplander. The sheep and goat are natives of the mountainous parts of Central A. The horse and the ass seem to belong to the same regions; and all of these have been domesticated from the earliest times. The camel is of incalculable value as a beast of burden in the regions of heat and drought, and as affording the means of traversing the great deserts. It is used principally in the s.w. of A. and in India. The elephant is a native of the tropical parts of A., but is of a different species from that of Africa. The reindeer constitutes the chief wealth of some of the tribes of the north. Dogs are also used by some of the Siberian tribes for drawing their sledges. Different races of dogs are domesticated in different parts of A., and a small kind is fattened for its flesh in China; but in the Mohammedan parts of A., the dog is reckoned an unclean animal, and is known chiefly as a prowler about towns and villages, and a devourer of offal.

The tropical parts of A. abound in monkeys, of which the species are very numerous. Among them are some with long and some with short tails, but none with prehensile tails, like the sapajous of America. Many are altogether tailless, and among these is the orang-outang, found in the s.e. islands. A much larger ape, called the pongo, has been said to exist in Borneo, but it is still a doubtful species. The same warm regions abound in bats, many of which are of large size, and feed upon fruits, not upon insects. The flying lemur or colugo is another remarkable animal of the Indian Archipelago.—Bears are found in all parts of A.—the white bear in the extreme north, and other formidable species in the more temperate parts; while the tropical regions produce bears which are not ferocious, and feed chiefly on insects, fruits, and honey.

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Badgers also are found in A., and quadrupeds of several other plantigrade genera, allied to the bear, but of comparatively small size and inoffensive habits, as the beautiful Panda (*Ailurus*) of the n. of India, and the Binturongs (*Ictides*) of Malacca and the neighboring archipelago.—Animals of the Weasel family (*Mustelidæ*) are numerous, among which the Teledu (*Mydaus meliceps*) of Java rivals the skunks of America in the horrible stench with which it surrounds itself for defense. More important are the sable and the sea-otter, pursued in the n. regions upon account of their furs.—Of the Dog family, or *Canidæ*, A. has not only wild dogs, but also wolves, foxes, hyenas, and jackals; the two former abounding chiefly in the colder, the two latter in the warmer regions. The arctic fox inhabits the most northerly shores and islands. The warmer parts of A. produce a number of species of the allied family of the *Viverridæ*, among which are the mangouste or Indian ichneumon—famous, like the Egyptian ichneumon, for the destruction of serpents—and the civet, from which is obtained a celebrated perfume.—Of feline animals, the most dreadful are the lion and tiger; the latter of which is peculiar to A., abounding in the warm regions of the s. and e., never extending westward beyond the mountains and deserts which separate India from Persia; but advancing far to the n., beyond the limits to which the lion advances, and even to the confines of Siberia. The leopard, the ounce, and many other cats, some of them large and dangerous, are found in A., especially in the warmer parts. Among them is the chetah, or hunting-leopard, tamed for the chase in India.—A few small marsupial (or pouched) quadrupeds (*Phalangers*) are found in the Moluccas, and form one of the links by which the natural history of A. is connected with that of Australia.—The *Glîres* or *Rodentia*, on the contrary, are numerous in all parts of A., and many species are peculiar to it. Squirrels, marmots, rats, mice, hares, etc., are common in all except the most northerly regions. The brown rat, now so common in Europe, is said to have emigrated from Persia as recently as the beginning of the 18th c. Lemmings abound in Siberia and the Tatarian deserts, of which the jerboa is also an inhabitant. Porcupines are frequent in the warmer parts of A., and the beaver is found in the north.—Of edentate quadrupeds, the Pangolins (*Manis*) alone are Asiatic, and these are confined to the tropical regions.—Of *Pachydermata*, there are, besides the elephant, the horse, etc., already mentioned, several species of rhinoceros, wild boars, the babyroussa, and a species of tapir; all except the wild boar, natives of the warmest climates. One of the most interesting facts, however, connected with the natural history of A. is the abundance of remains of the mammoth, or fossil elephant, in the coldest parts of Siberia, its tusks still affording a considerable supply of ivory. Of ruminating animals, besides those of the ox-kind, already mentioned, and the sheep and goat, there are deer, antelopes, and musks or musk-deer. The reindeer and elk

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are natives of Siberia; further s. the species of deer are much more numerous, and the same countries produce many species of antelope. The musks are found in the central and southern parts of the continent; one of them, a native of the highest mountains, yielding the much-prized perfume from which it derives its name.—A. has vultures, eagles, and other *Falconidæ*, owls, ravens, and other birds of the crow kind, herons, storks, cranes, etc., Swans, geese, ducks of various species, and many other *Anatidæ*, frequent its waters, some of them abounding even in the oldest regions. Albatrosses are very numerous on the Kamtchatkan shores; flamingoes on those of the more s. countries. Pigeons abound, and among them is the turtle-dove. The gouras of the Indian Archipelago are birds of the pigeon family, of which one species is almost as large as a turkey. There are many kinds of thrush, finch, warbler, bunting, sparrow, and other birds identical with or allied to those of Europe, among which is the nightingale, often mentioned by the Persian poets, and many, also, that are peculiar and characteristic, particularly in the warmer regions. Of these may be mentioned the splendid birds of paradise of the s.e. islands, peacocks, pheasants, etc. The gallinaceous birds of Asia are numerous, and from this continent was probably derived the domestic poultry of other parts of the earth. The abundance of the parrot tribe is a point of resemblance between the tropical parts of Asia and other tropical countries, but lorries are peculiar to the East Indies. The ostrich inhabits the deserts of Arabia as well as of Africa. The cassowary is found in the s.e. islands. The edible swallows' nests of the East Indian coasts have long been celebrated.—Lizards and other saurian reptiles are very abundant in the warmer parts of Asia; and great crocodiles and gavials infest the rivers of the East Indies. Boas, pythons, and other great serpents are found in the tropical regions, which produce also many venomous serpents. The cobra da capello is one of the most dreaded. But the temperate parts of Asia also have venomous serpents, scarcely less dangerous. Some of the East Indian tortoises are remarkable for their great size, and turtles are found in the seas.—Both the salt and fresh waters of Asia produce many kinds of fish. The *Salmonidæ* of the rivers of Siberia supply an important part of the food of its inhabitants. The goldfish, now well known in Britain, is a native of China. Some of the fish of the tropical parts of Asia have attracted attention from the peculiarity of their form or habits. Insect life is exceedingly abundant in the warm parts of Asia, as in all other warm countries. Bees are numerous, and honey is produced in great quantities. Of other insects, it seems only necessary here to mention the silk-worm, introduced from Asia into Europe; and the locust, which sometimes devastates great tracts of the Asiatic countries bordering on the Mediterranean and the Black Sea, and occasionally extends its ravages into regions further west. Of molluscous animals, the pearl-oyster de-

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serves particular notice, upon account of the important pearl-fisheries in different places.

Ethnography.—The whole population, consisting of 840,000,000 people, may be divided into the Mongolian, Aryan, and Semitic groups. The *first* of these includes all the peoples and tribes in the c., n., and s.e., of Asia; the *second* (see ARYAN) comprises the inhabitants of Northern India, Afghanistan, Persia, and part of Asiatic Turkey; the *third* includes the Syrian, Hebrew, and Arabian races. See ETHNOLOGY.

A further subdivision and classification may be made as follows: 1. The *East-Asian group*, including the peoples of Tibet, China, Japan, Corea, and the Indo-Chinese peninsula; all alike in the use of monosyllabic languages. This last people, however, must be subdivided into Western and Eastern, the former comprising the inhabitants of the Burman empire, Pegu, Laos, and Siam, having affinities with the Hindus; and the latter comprising the inhabitants of Tonquin, Cochin-China, and Cambodia, having affinities with the Mongolians of Tibet and China. 2. The *Tatar group*, including the Turkomans, Mongols, and Tungusians, who are spread over the whole table-land of Central Asia and the neighboring lands in the north. The Turkoman family is divided into three sections—the first including the cast Turkomans, inhabiting Tashkend, Khiva, Balkh, and Usbekistan; the second including the so-called Tatars of the Urals and the neighborhood of Astrakhan and Kazan; the third including the Turks or Osmanli. With the exception of a few small tribes in Siberia, all the Turkish varieties are Mohammedans, use the Arabic alphabet, and employ numerous Arabic words in their dialects. 3. The *Siberian group*, including the Samoides, people of Kamtchatka, etc., speaking languages which have only recently been studied by philologists. 4. The *Malay-Polynesian group*, mixed with Australasian negritos, are spread over all the islands of Polynesia and the Indian Archipelago. The Malayan people of Java, Sumatra, Celebes, the peninsula of Malacca, the Sunda Islands, Moluccas, and Philippines, have an incipient literature, formed under Moslem and (since the 16th c.) under European influence. The South Sea islanders are clearly divided into two races by physical form, color, and language. One race is allied to the Australasian negrito, and the other to the Malayan. In most of the islands, there is a partial intermixture of the two races, but generally the distinction is obvious. It is probable that all the copper-colored Polynesians belong to the same family with the people of the Indian Archipelago. 5. The *Deccan group*, including all the people employing the Tamul, Carnatic, Telugu, and Singalese languages, all having a certain measure of civilization and a literature. 6. The *Indo-Germanic or Aryan group*, marked and subdivided by the three languages, Sanskrit, Persian, and Armenian. About thirty distinct nations, each having a peculiar dialect and literature, belong to the first subdivision; the second

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includes the peoples of Beloochistan, Afghanistan, Persia, and Kurdistan; the third, the Armenians. All these families have literatures partly written in dead languages—the Sanskrit, Pali, Zend, and old Armenian. 7. The heterogeneous tribes inhabiting the Caucasus, whose affinities are not yet settled. 8. The *Semitic group*, including all the peoples whose languages are related to the Hebrew and Arabic.

Religions.—The same Asian characteristic of variety and wide contrast is found in the creeds as in the countries and tribes of people; the Brahminical religion of India; the doctrines of Buddha, Confucius, and of Lao-tse in China; the worship of the Grand Lama in Tibet; the creed of Islam in several varieties in Arabia, Persia, and India; the rude heathenism of the north; the various sects of native Christians in Armenia, Syria, Kurdistan, and India; the Greek Church in Siberia; these and other forms of religious profession show diversities and contrasts nearly as striking as those of Asian geography. Christianity, now the religion of Europe and America, owes its origin to Asia. For the existing religious systems of Asia, see MOHAMMEDANISM: INDIA (*Religion*): BUDDHISM: LAMAISM: etc.

Civilization.—The number of people civilized—in the Asiatic sense of the word—is far greater than that of wild and nomadic hordes; but culture here, when arrived at a certain point, assumes a stationary character, widely differing from the restless intellectual activity and industrial progress of Europe. The laws of states, families, industry, commerce, art, and science are in India and China so many branches of one fixed and permanent religious system, which has maintained its sway through many centuries, and would long remain unchanged, if left undisturbed by European influence. The Arabs, Persians, and Turks, collectively known as the Easterns, are distinct in civilization from the Hindus and Chinese. The institution of slavery among the former, of *caste* among the Hindus, and the civil and political equality of China, are distinguishing marks. The Turk is a monotheist and fatalist; the Hindu is either a mystical pantheist or polytheist, acknowledging a multitude of gods; the Chinese is rather a utilitarian moralist.

Industry.—The industry and commerce of the Asiatic continent bear no adequate proportion to its capabilities: see the titles of the different countries.

Political Aspect.—The political institutions of A. present some striking contrasts. While the barbarous hordes in the n. live almost without the idea of government, and scarcely know that the Russian czar claims them as his subjects; and the nomadic tribes, under their khans or sheiks, have a sort of patriarchal government, subordinate to higher powers; monarchy and despotism have existed in their extreme forms among the more cultivated nations. The government of China is an absolute monarchy in form, but, in fact, is strictly limited by the force of tra-

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dition. The emperor is apparently unlimited in authority; but it is an essential duty of an emperor to rule exactly according to the precepts handed down by his ancestors. Reverence for ancestors and their institutions is, therefore, the sole presiding and conservative principle which has so long preserved the great Chinese empire from political changes. A., now so passive, anciently was active in the great movements of the world's history; contended against Egypt and Greece, and afterwards contributed to the greatness and glory of the Macedonian and Roman empires. From the n. of the Caspian Sea, came the vast hordes of the Huns who spread themselves abroad over Europe. The armies of Genghis Khan and Tamerlane overran the Slavonian plains, while the Arab caliphs, with their fanatical troops, established their religion and government in three-quarters of the world. Under the Osmanli fell the eastern Roman empire, and still the Turk maintains a political position in Europe, though a position now becoming very feeble and insecure. In proportion as Europe has advanced, A. has declined in political power, so as to countenance the theory of a gradual movement of the spirit of civilization and progress from the eastern to the western world. As soon as the Asiatic nations have reached a certain moderate pitch of culture, the history of civilization ceases so far as they are concerned, and is followed by the mere chronology of states or dynasties. It appears that all great future changes in the destinies of the peoples of Asia must proceed from European impulses. When Portuguese ships had rounded the Cape and so reached India, a new era of Asian history began. The Portuguese, the Spaniards, Dutch, French, Danes, and English planted their standards on Indian soil. The English speedily extended their dominion here, and soon overshadowed all the other European powers; though the Portuguese and French still maintain their footing in Hindustan, and the French, the Spaniards, and the Dutch own large territories in Further India or the Indian Archipelago. Lately England has increased her influence in the extreme w. of Asia; having secured the occupation of Cyprus, while guaranteeing the defense of the Asiatic dominions of the Porte. Meanwhile Russia has extended her sway over Siberia, Caucasia, and Turkestan; securing thus the keys of China and the approaches to Persia. Even in some of the nominally independent powers, European influence is very powerful; the throne of Persia, for example, is surrounded by European diplomatists. And while Russia and Britain are striving to share between them supremacy in Asia, the French and the Americans have a large share of the commerce of the eastern coasts.

The following table gives an approximate estimate of the area and population of A., according to the more important existing political divisions:

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	Area in sq. m.	Population.
RUSSIAN ASIA—		
Caucasus (Russian).....	182,500	6,534,850
Siberia (Russ.).....	4,824,570	4,093,500
Transcaspian Region (Russ.)... ..	230,400	206,000
Caspian Sea	169,670	
Turkestan (Russ.).....	1,541,500	5,245,000
	6,948,640	16,079,350
WESTERN ASIA—		
Asiatic Turkey	729,200	16,133,000
Samos (trib. to Turkey)	210	41,200
Cyprus (British)	3,580	209,200
Independent Arabia.....	968,200	3,700,000
Aden and Perim (Brit.).....	70	34,900
	1,701,260	20,118,300
IRAN AND TURAN—		
Persia (Russ. and Brit. prot.).... .	636,400	7,653,600
Afghanistan (Br. and Russ. influence)..	240,000	4,000,000
Kafiristan (Russ and Brit. prot.).....	20,000	1,000,000
Beluchistan (Brit. prot.).....	106,800	350,000
Khiva (Russ. prot.).....	22,300	70,000
Bokhara and Karategin (Russ. prot.)..	92,300	2,130,000
	1,117,800	15,203,600
INDIA—		
British Territory... ..	787,000	213,567,200
Feudatory States (Brit.).....	509,730	66,050,000
Ceylon (Brit.).....	25,360	3,008,000
French Possessions.....	195	282,700
Portuguese Possessions....	1,605	475,200
Himalaya States (Brit.).....	89,600	3,300,000
	1,413,490	286,683,100
INDO-CHINESE PENINSULA—		
Wild Tribes of Assam (Brit. prot.)....	25,290	200,000
Lower Burmah (Brit.).....	277,720	7,605,800
Upper Burmah (Brit.)		
Straits Settlements (Brit.).....	1,450	540,000
Siam	280,650	6,000,000
Malacca States	31,500	300,000
Cochin-China (Fr.).. .	225,620	24,100,000
Tonkin (Fr.)		
Cambodia (Fr. prot.).....		
Annam (Fr. prot.).....		
	1,042,230	38,745,800
CHINA AND JAPAN—		
China Proper and Manchuria.....	1,660,300	395,000,000
Vassal States (Mongolia, Tibet, Zun- garia, Eastern Turkestan)	2,519,300	9,200,000
Corea (Chin. prot.).....	84,250	10,500,000
Hong-Kong (Brit.).....	32	160,400
Macao (Port.).....	28	68,100
Japan.....	148,500	37,869,000
	4,412,410	452,797,500
SOUTHEASTERN ASIA—		
Dutch East Indies.....	568,900	28,468,000
Philippines, Marianes, Caroline, and Sulu Archipelago.....	116,260	5,631,000
East Timor, etc. (Port.).....	6,290	300,000
North Borneo and Labuan (Brit.)	27,530	181,300
Borneo States (Sarawak and Brunei)..	62,940	450,000
	781,920	35,080,300
Total, Asia.....	17,417,750	864,707,950

ASIA—ASIPHONATE.

ASIA, CENTRAL: term usually applied in its geographical sense to the region between the Altai Mountains and the Persian Gulf, including part of Siberia, all Turkestan, Afghanistan, Beloochistan, and part of Persia. An earlier usage—that of Humboldt—gave this name to the khanates of Bokhara and Independent Tartary. In Russian official language, Central Asia is an administrative division of the empire lying to the s.w. of Siberia, and comprising, with part of what used to be called Siberia, the recent Russian annexations in Turkestan. Russian Central Asia is divided into the governments of Ak-mollinsk, Semipalatinsk, Turgai, Uraisk, Semiretchensk, Syr-Daria, Sarefchan, Kuldja, Amu-Daria, the Trans-Caspian territory, and Ferghana. The total area is stated at 1,227,000 sq. m. ; pop. 4,490,000.

ASIA MINOR: ancient name of what is now called Anatolia (q. v.). Here, in Ionia, was the early seat of Grecian civilization, and here were the countries of Phrygia, Lycia, Caria, Paphlagonia, Bithynia, Lydia, Pamphylia, Isauria, Cilicia, Galatia, Cappadocia, etc., with Troy, Ephesus, Smyrna, and many other great and famous cities. Here, from the obscure era of Semiramis (about B.C. 2000), to the time of Osman (about A.D. 1300), the greatest conquerors of the world contended for supremacy; and here took place the wars of the Medes and Persians with the Scythians; of the Greeks with the Persians; of the Romans with Mithridates and the Parthians; of the Arabs, Seljuks, Mongols, and Osmanlis with the weak Byzantine empire.

ASIAN, a. *ā'shĭ-ăn*, or **ASIATIC**, a. *ā'shĭ-ăt'ĭk*: of or pertaining to Asia. **ASIATIC**, n. an inhabitant of Asia. **ASIATICISM**, n. *ā'shĭ-ăt'ĭ-sĭzm*, imitation of oriental manners.

ASIARCH, n. *ā'shĭ-ārĭk* [Gr. *asiarchēs*]: under the Romans, the director-general of religious ceremonies in the province of Asia. The expression occurs in Acts xix. 31, "And certain also of the Asiarchs." Properly speaking, there was but one A. residing at Ephesus, the others referred to being his subordinates.

ASIDE, ad. *ă-sĭd'* [AS. *a*, on, and *side*]: to one side; apart from the rest; at a little distance from the straight line: N. in a *drama*, a speech made by one actor and supposed not to be heard by the rest. To **SET ASIDE**, to annul the effect of, as a verdict or judgment of a court of law; to place away for a future occasion or purpose.

ASILIDÆ, n. *ă-sĭl'ĭ-dē*: family of *Diptera*, generally called Hornet-flies. They are fierce and voracious, usually feeding on insects which they catch on the wing. In flying, they make a humming noise; at rest, sit on top of plants. All are harmless to man. **ASILUS**, genus.

ASINALUNGA, *ă-sē'nā-lŏn'gā*, or **SINA LONGA**: town of Tuscany, 22 m. s.e. of Siena. Pop. 1,500.

ASININE, a. *ăs'ĭ-nĭn*: see under **Ass**.

ASIPHONATE, a. *ă-sĭf'ŏ-năt* [Gr. *a*, without; *siphōn*, a siphon]: not possessing a respiration tube or siphon; applied to a division of the lamellibranchiate mollusks.

ASITIA—ASMDEUS.

ASITIA, n. *a-sīsh'ī-ă* [Gr.—from *a.* without; *sitos*, wheat food]: in *med.*, loss of appetite, loathing of food.

ASK, v. *ăsk* [AS. *acsian*: Ger. *heischen*, to inquire, to demand: Dut. *eischen*: Icel. *askia*, to demand, to require]: to beg; to solicit; to seek from; to question; to inquire. ASK'ING, imp. ASKED, pp. *ăskt*. ASK'ER, n. one who.—SYN. of 'ask': to request; beg; beseech; supplicate; entreat; implore; solicit; crave; adjure; interrogate; seek; petition; require; demand; claim; inquire.

ASKANCE, ad. *ăs-kăns'* [It. *schiancio*, athwart, across; *scansare*, to turn aside: Dut. *schuin*, aslant: OF; *a scanche*, obliquely]: sideways; looking towards one corner of the eye. ASKANT, ad. *ăs-kănt'*, obliquely; on one side.

ASKEW, ad. *ăs-kū'* [Icel. *skeifr*: Ger. *schief*, oblique, wry: Icel. *á ská*, askew: L. *scævus*, on the left hand]: awry; obliquely; aside.

AS'KEW, or AS'COUGH, ANNE: d. 1546, July 18: one of the sufferers for Protestant opinions at the dawn of the Reformation in England. Having embraced the views of the reformers, she was turned out of doors by her husband, a gentleman of Lincolnshire, a zealous Rom. Cath. On this she went up to London to sue for a separation; but was eventually arrested on a charge of heresy, and was examined by the Bishop of London and others on the doctrine of transubstantiation, the truth of which she denied. After further examination and torture by the rack, she was burned at the stake, in Smithfield.

ASLANI, n. *as-lā'nī* [Turk. and Tart. *aslan*, *arслан*, a lion]: old Turkish coin worth from 115 to 120 aspers (q.v.). The name is sometimes applied to the Dutch dollar in the Levant.

ASLANT, ad. *ă-slănt'* [AS. *a*, on, and *slant*: Scot. *ask-lent*, askew: OF. *eschincher*, to slip]: not at a right angle; on one side; leaning towards.

ASLEEP, ad. *ă-slēp'* [AS. *a*, on, and *sleep*]: in a state of sleep; at rest.

ASLOPE, ad. *ă-slōp'* [AS. *a*, on, and *slope*]: in a sloping manner.

ASMANNSHAUSEN, *ăs'măns-how'zēn*: village in the jurisdiction of Rüdesheim, Nassau; famed for the wine produced on the slate-mountains in its vicinity. Of this there are two kinds, red and white, the former greatly preferred. It has a rich red color, like Burgundy; possesses a rare aromatic flavor; and is noted for its uncommon strength and fire. But it retains its excellent qualities only about three or four years; after which, year by year, it becomes weaker, and loses its color. The choicest sort, preferred by connoisseurs to all the other red wines of the Rhine, and even to Burgundy itself, is cultivated in the ducal vineyards at Wiesbaden.

ASMATOGRAPHY, n. *ăs-mă-tōg'ră-fī* [Gr. *asma*, a song; *graphē*, a writing]: a writing or treatise on songs.

ASMDEUS, *ăz-mo-dē'ūs* (properly, ASCHMEDAI, 'the

ASMONEAN—ASP.

destroyer'): an evil genius or demon mentioned in the later Jewish writings. A. was described as the author of many evils. In the book of Tobit (a.v.), he is represented as slaying the seven husbands of Sara, and hence, in modern times, has been jocularly spoken of as the destroying demon of matrimonial happiness. In the Talmud, A. is described as the prince of demons, and is said to have driven Solomon from his kingdom.

ASMONEAN, or ASMONÆAN, a. *ās'mō-nē'ăn*: pertaining to the Asmoneans, a family that reigned over the Jews 126 years, till B.C. 39. See MACCABEES.

ASO'CA (*Jonesia Asoca*): Indian tree of the nat. ord. *Leguminosæ*, sub order *Cesalpinea*; remarkable for the beauty of its red and orange flowers. The leaves are abruptly pinnate, shining, and very beautiful. The A. is often mentioned in Indian poetry, and is connected also in various ways with the Hindu mythology.

ASO'KA, or ASHO'KA, or DHAR-MA-SO'KA: an Indian king, who lived B.C. 3d c.; called the 'Buddhist Constantine,' having organized Buddhism as the state religion. As king of Magadha or Behar, A. became a zealous convert to Buddhism abt. B.C. 257, and in 244 he convened the third of the great Buddhist councils at Patna. Throughout his kingdom and the conquered provinces he published the grand principles of the system; and the edicts by which these sermons were preached are still found graven deep on pillars, caves, and rocks from Peshawar and Kathiawar to Orissa. About 40 such rock inscriptions are still extant; but he is said to have erected 84,000 memorial columns. His civil organization and administration of justice were admirable.

ASOLA, *á-sō'lá*: town of Italy, province of Brescia; 19 m. w.n.w. of Mantua. Pop. 1,000.

ASOMATOUS, a. *ā-sōm'ā-tūs* [Gr. *a*, without; *sōmă*, a body; *sōm'ata*, bodies]: without a material body.

ASONANT, a. *ās'ō nănt* [Gr. *a*, without: L. *sonan'tem*. sounding]: without sound; not resonant.

ASOPIA, *ā-sō'pī-ă* [Gr. *Asōpos*, god of the river *Asopus* in Achaia]: genus of moths of the family *Pyralidæ*. *A. farinalis* is the so-called Meal-moth.

ASP, n. *ăsp*, or ASPIC, n. *ăs'pīk* [OF. *aspe*: F. *aspic*, a kind of viper—from L. *aspis*, or *aspīdem*, a venomous serpent]: a small serpent whose bite is fatal, the name of which has come down from ancient times; the vague descriptions of ancient authors, however, causing uncertainty as to the species. It is very generally supposed to be the *Naja Haje*, the El Haje or Haje Nasher of the Arabs, which is very common in Egypt, Cyprus, etc., and often appears in hieroglyphic and other sculptures as one of the sacred animals of ancient Egypt. It is sometimes from 3 to 5 ft. in length, of nearly equal thickness throughout, with a gradually tapering tail; brownish, varied with dark and pale spots; the scales of the neck, back, and upper surface of the tail slightly carinated; the tail about one-fourth of

ASP.

the whole length of the animal. The neck is capable of considerable dilatation, through the distension of its loose skin, although not so much as that of the nearly allied cobra da capello of India (*Naja tripudians*). The dilatation of the neck takes place when the serpent is irritated. The jugglers of Egypt are accustomed to perform tricks with this serpent, as those of India with the cobra da capello, causing it to dance to their music; after they have first, however, carefully extracted the poison-fangs. It is very venomous. Several varieties exist at the Cape of Good Hope, one of which is nearly white; and one is called Spuugh Slang, or Spitting Snake, by the colonists, from its supposed power of ejecting its poison to a distance when irritated; the poison which distils from the fangs in such



Naja Haje.

circumstances being probably carried off by the forcible expirations which the creature makes—a characteristic, however, not exclusively belonging to a particular variety.—Other serpents of the same family, *Viperidæ*, are by some believed to be the true asp, particularly *Vipera Echis* and *V. Cerastes*. The former is a grayish or yellowish brown color, with rays and eye-like spots on the upper parts; it is found both in India and the n. of Africa. The latter is of a grayish color, and has a very broad heart-shaped head, a short, obtuse, rounded muzzle, and the superciliary or eye-brow scales remarkably developed, so that one of them is often produced into a sort of spine; it inhabits the deserts of n. Africa.—The name asp is now generally given to *Vipera Aspis*, a native of the Alps, found also in the s.e. of Europe and in Sicily, which much resembles the common

ASP—ASPARAGUS.

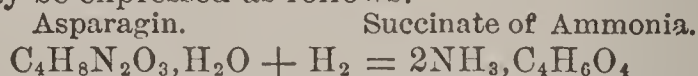
viper, but is more slender, and has a larger head; it is also more venomous.

ASP, n.: see ASPEN.

ASPALATHUS, *ās-pāl'ă-thūs* [Gr. *aspalathos*, a thorny shrub whose bark and roots yielded a fragrant oil—named from the island *Aspalathus*, where it grew; it has not been certainly identified]: ancient unidentified shrub; also a plant called the Rose of Jerusalem, or Our Lady's Rose; in modern bot., a genus of plants belonging to the order *Leguminosæ*, sub-order *Papilionaceæ*. It contains about 150 shrubs and under-shrubs,

ASPALAX, *ās'pa-lăx* [Gr. *aspalax*, or *spalax*, a mole]: genus of *Rodentia* to which belongs the *A. typhlus* of Turkey, s. Russia, and Persia. It has no real affinity to our mole, which belongs to *Insectivora*.

ASPARAGIN, *ās-păr'ă-jîn*, $C_4H_8N_2O_3$: a crystalline substance which exists ready formed in the common asparagus, in the marsh-mallow, in comfrey, in potatoes, in chestnuts, in leaves of the deadly nightshade, in licorice-root, in the milky juice of lettuce, in the tubers of the dahlia, and in the young shoots of vetches, peas, beans, etc. According to Piria, the young shoots of these plants, when formed in the light, contain as much asparagine as when they are grown in the dark, but the asparagine disappears as the plant arrives at the flowering stage. Other chemists, including Pasteur, find that the vetches grown in light are free from asparagine. This substance is readily obtained from the expressed juice of the young shoots of asparagus, of young vetches, etc., which, after filtration and evaporation to a syrup, soon deposits it in crystalline prisms of a right rhombic form. These crystals dissolve freely in boiling water, the cooled solution having a mawkish and cooling taste, and a slight acid reaction. Asparagin exhibits two remarkable transformations. (1) When its aqueous solution is heated with alkalies or acids, it is decomposed into aspartic acid, $C_4H_7NO_4$, and ammonia; from this and other reactions, there is no doubt that it should be regarded, according to modern views, as the amide (q.v.) of aspartic acid. (2) While a solution of pure asparagine-crystals remains unchanged, if any coloring matter is present the solution passes into fermentation, and the whole of the asparagine is converted, by the assimilation of hydrogen, from the pigment into succinate of ammonia, a reaction which may be expressed as follows:



Like most of the amides, this substance unites both with acids and alkalies, but the resulting compounds are of little general interest. That asparagine plays an important part in the physiology of plants, is obvious from its wide distribution.

ASPARAGUS, n. *ās-păr'ă-gŭs* [L.—from Gr. *aspar'agos*]. a well-known plant, whose turios or young shoots are used at table; the cultivated *Aspar'agus offic'ina'lis*, ord. *Liliă'*

ASPARAGUS.

cĕæ. ASPARAGINOUS, a. *ăs'pār-ăj'ĭ-nŭs*, eaten like asparagus. ASPARAGIN, n. *ăs pār'ă-jĭn*, or ASPAR'AMID, *-măd*, a crystalline substance obtained from asparagus. ALPAR'AGUS-STONE, a translucent mineral of a greenish-yellow color, sometimes passing into a wine color. See APATITE. ASPAR'TIC ACID, an acid obtained from asparagine.

ASPAR'AGUS: genus of plants of the nat. ord. *Liliaceæ*, having an almost bell shaped six-partite perianth upon an articulated stalk, six stamens, one style, with three recurved stigmas, and the cells of the berry two-seeded. The species of this genus are herbaceous or shrubby plants, natives chiefly of the s. of Europe and of Africa, with abortively diœcious flowers; the stem is unarmed in some, in others thorny; at its first sprouting leafless, and covered with scales at the top; afterwards very much branched, with



Asparagus.

a, a young shoot; *b*, flowers; *c*, the upper end of a stem, showing branches, leaves, and fruit (all reduced).

numerous fasciculate, generally bristle-like leaves. The most widely diffused species is the Common A., *A. officinalis*, a native of Europe, which grows on the banks of rivers and on the seashore, in meadows and bushy places, especially in sandy soils, and it is also in general cultivation as a garden vegetable; its young shoots, when they first sprout from the earth, being a much esteemed article of food, though in only a slight degree nutritious. These sprouts contain a peculiar crystalline substance, called *Asparagine*, (q.v.) and have a specific action on the urinary organs, so that their long continued use in very large quantities is apt even to produce bloody urine. They are no longer retained in the pharmacopœia, but both the shoots and roots of A

ASPASIA.

are still occasionally used as a diuretic in dropsies, and as a lithic to dissolve urinary calculi. *A.* was grown by the ancient Romans, but has been greatly improved by cultivation. It is propagated usually by seeds which may be sown where the crop is to be produced, though transplanting in the spring after sowing is usual. The ground should be deeply trenched or plowed and a very heavy coating of manure incorporated with the soil. Rather light, sandy ground is preferred. Plants may be set in spring or fall, in rows 2–3 ft. apart and 9 in. apart in the row, and should be kept free from weeds. In cold regions, on the approach of winter, the ground should be covered with stable manure to the depth of 3 or 4 in., which should be forked into the ground early in the spring. In warm climates manure should be applied in the spring. Cutting can be commenced in three or four years from sowing the seed, and the bed should remain productive 20 years. There are about a dozen varieties.—The *A.* beetle (*Crioceris asparagi*), introduced from Europe about 1860, is often very destructive. Hand-picking, letting domestic fowls run among the plants, the use of pyrethrum powder, and destroying all *A.* plants except those required for shoots, are the principal remedies.—A kind of spirit is sometimes made from *A.* seed, and the berries form a substitute for coffee. The shoots of several other species also are eaten, as those of *A. tenuifolius*, *A. acutifolius*, and *A. albus*, natives of the s. of Europe. On the other hand, the sprouts of the Bitter *A.*, *A. scaber*, which is very similar to the Common *A.*, are uneatable on account of their great bitterness. Climbing *A.* with exquisite feathery leaves is cultivated as an ornamental plant.

ASPASIA, *ās-pā'shī-a* [Gr.—from *Aspasia* (q.v.), or *as pazomai*, to welcome kindly]: genus of plants belonging to the order *Orchidaceæ*.

ASPASIA, *ās-pā'shī-á*: B.C. 5th c.: one of the most remarkable women of antiquity; b. Miletus, dau. of Axiochus. The fact that in Athens all foreign women, whatever their character, were equally esteemed, or rather disesteemed, and that their children, even when begotten in wedlock, were held illegitimate, has originated the erroneous notion that *A.* was a courtesan. She certainly broke through the restraint which confined Athenian matrons to the seclusion of their own homes; for after her union with Pericles, who had parted from his first wife by her own consent, her house became the rendezvous of all the learned and distinguished people in Athens. Socrates often visited her. Her eloquence and knowledge of politics were extraordinarily great. Her husband—though, strictly speaking, the Athenian law would have refused this appellation to Pericles—was honored with the title of Olympian Jove, while she herself was dignified with the name of Juno. From the comic writers and others, she received much injustice. It was Hermippus, the comic poet, who took advantage of a temporary irritation of the Athenians against Pericles, to accuse *A.* of impiety; but the eloquence of the great statesman disarmed the enmity of the judges, and procured her acquittal. Her influence over Pericles must have been singularly great, though it has obviously been exaggerated.

ASPASIOHITE—ASPEN.

and even caricatured. The brilliant but not historically accurate Aristophanes charges her with the origin both of the Samian and Peloponnesian wars, the latter on account of the robbery of a favorite maid who belonged to her. Plutarch vindicates her against such accusations; and Thucydides, who details minutely the causes of the Peloponnesian war, does not mention her name in connection with these. After the death of Pericles, A. married Lysicles, a cattle-dealer (an important, lucrative, and dignified profession in ancient times), who, through her influence, soon became an eminent man in Athens. The name of A. was, after her death, applied to many women of remarkable accomplishments and amiability.

ASPASIOHITE, *ās-pā'zī-o-līt* [Gr. *aspasios*, greatly welcomed]: a mineral of a green or grayish color. It occurs in Norway with iolite, of which it may be only an altered state.

ASPÉ, *ās'pā*: t. of Valencia, Spain, province of Alicante; 21 m. w. from Alicante, near the river Elcha. It is moderately well built, but the streets are narrow and winding. It has numerous flour-mills and oil-mills, also soap-manufactories and brandy distilleries. There is considerable trade in wine. Pop. 6,744.

ASPECT, n. *ās'pěkt* [L. *aspectus*, looked at attentively—from *ad*, *specto*, I look]: that which looks towards; look; appearance; position or situation; view. ASPECT'ABLE, a. that may be looked at or beheld.

AS'PECTS, in Astronomy: certain positions of planets with respect to one another, as seen from the earth. In the days of astrology, there were five Aspects—Conjunction (indicated by the symbol $\cup$), Sextile (*), Quartile ($\square$), Trine ($\triangle$), Opposition ($\oslash$). Two planets are in conjunction when they have the same longitude; the aspect is sextile when they are 60° apart; quartile, when the distance is 90° ; trine, when it is 120° ; and at 180° they are opposite to one another, or in opposition. Astrology ascribed to these A. great influence over the fate of individuals and of nations. The only two of the terms now in use are *conjunction* and *opposition*.

ASPEN, n. *ās'pěn*, or ASP [AS. *æspen*: Icel. *ösp*, aspen]: a tree of the poplar kind whose leaves quiver or shake at the slightest breath of air; the *Populus tremula*, ord. *Salicaceæ*: ADJ. pertaining to an aspen.

AS'PEN, or TREMULOUS POPLAR (*Pop'ulus trem'ula*, see POPLAR): tree frequent in Europe and in Siberia. It is a native of Britain, and is frequent in Scotland, where it is found even 1,500 ft. above the sea. It has received the specific name *tremula*, from the readiness with which its leaves are thrown into a tremulous motion by the slightest breath of wind—a property for which, indeed, the aspen-leaf has become proverbial. The leaves are nearly orbicular, but broadly toothed, so as almost to exhibit angles. The footstalks are compressed, which favors the readiness of motion. It grows quickly, with a straight stem, reaching

ASPER—ASPERATE.

to a height of from 60 to 80 or even 100 ft. In unfavorable situations, it becomes dwarfish. The wood is soft, porous, light, white, and smooth; it does not make good fuel, but is very fit for the turning-lathe, and especially for being made into troughs, trays, pails, etc. It is deemed excellent for arrows. If the stem be peeled and allowed to dry before it be cut down, the wood becomes harder, and is then capable of being used as timber for the interior of houses; and on this account the tree is of great importance



Aspen (*Populus tremula*) reduced.

a, a portion of a branch with catkins; **b**, do., with leaves.

in many districts, and the more so as it succeeds in any soil, although it prefers one which is moist and gravelly. The bark contains a great quantity of a bitter alkaloid, *Salicin*. The charcoal made from this tree can be used in the manufacture of gunpowder.—*Populus tremuloides*, a similar species, native of N. America, is called the American A. It is regarded by some as a mere variety. Very similar, also, is another N. American species, *P. grandidentata*, ovate, large-toothed leaf, instead of cordate.

ASPER, n. *ās'pér* [L. *L. asperus*, *asprus*, *asperum*, *asprum*: mod. Gr. *aspros*, white: Turk. *aqtscheh*, *aktsche*, white—used substantively as the name of a coin]: an old Turkish silver coin, worth a little more than one cent.

ASPERATE, v. *ās'pér-āt* [L. *aspērātus*, made rough—from *asper*, rough]: to make rough or uneven. **AS'PERATING**, imp. **AS'PERATED**, pp. **ASPERATION**, n. *ās'pér-ā'-shŭn*. **ASPER**, or **ASPRE**, a. *ās'pér*, rough: sharp in sound; bitter in spirit: N. the rough breathing (') placed over the initial letter of many Greek words, when that letter is a vowel, and over the second letter if a diphthong. It indicates that the vowel is to be aspirated, i.e., pronounced as if *h* preceded it. It is used also before *ρ* at the

ASPERGES—ASPERIFOLIOUS.

beginning of a word, to indicate that it should be pronounced like *rh*.

ASPERGES, n. *ās-pēr'jēs* [L. *asper'ges*, first word of prayer from Ps. li. 7, 'Thou shalt sprinkle me, O Lord, with hyssop,' etc]: formula sung in the *R. Cath. Ch.* by the priests while sprinkling holy water over the congregation, or over the sick; the instrument by which this is done, consisting of a broad brush with a handle. See ASPERGILL.

ASPERGILL, n. *ās'pēr-jīl*, or ASPERGILLUS, n. *ās'pēr-jīl'lūs* [L. *aspergo*, I scatter or throw]: in the *R. Cath. Ch.* a short staff surmounted by a brush for sprinkling holy water. AS'PERGIL'LIFOR'MIS, a. *-jīl'li-fōrm'is* [L. *forma*, shape]: in *bot.*, applied to little tufts of hair which assume the form of a brush.

ASPERGILLUM, *ās'pēr-jīl'lūm*: remarkable genus of Lamellibranchiate Conchiferous Mollusca, in which the shell has the form of an elongated cone, terminating at the larger end in a disk, which is pierced with numerous small tubular holes, the little tubes of the outer range being largest, and forming a sort of ray around it. The animals of this genus are borers, some of them living in sand, others burrowing in stone, wood, or thick shells. *A. Javanum* is popularly called the Watering-pot, and the same resemblance has suggested the name *A.* (from the Latin *aspergo*, to sprinkle). The most interesting feature in the structure of the shelly tube of *A.* is the presence of two small valves, incorporated in the substance of the tube, to which they bear a very small proportion. 'They there form the stamp,' says Owen, 'of its true affinities, but subserve as little any ordinary final purpose as the teeth buried in the gums of the fetal whale. The affinities are with mollusca inhabiting bivalve shells. A rudimentary bivalve shell is found, in like manner, cemented into the shelly tube of the fossil *Teredina*, which bored the drift-wood of the London clay.



Aspergillum.

a, the disk with holes; *b*, the rudimentary valves.

There is also a genus ASPERGILLUS in Botany containing many of the small fungi commonly known by the name of mould (q.v.), which occur on decaying substances of various kinds. Some of the species are peculiar to diseased animal tissues.

ASPERGILLUS: genus of fungi comprising many of the species of common molds.

ASPERIFOLIÆ, *ās-pēr-ī-fō'li-ē* [L. *asper*, rough; *folium*, a leaf]: Linnæus's name for the natural order of plants now called *Boraginaceæ*, or Borageworts.

ASPERIFOLIOUS, a. *ās'pēr-ī-fōl'ī-ūs*, or ASPERIFO'LI-

ASPERITY—ASPERSE.

ATE, -āt, [L. *asper*, rough; *fo'lium*, a leaf]: having leaves rough to the touch.

ASPERITY, n. *ās-pēr'ī-tī* [F. *aspérité*, roughness—from L. *asperitas*, roughness—from *asper*, rough]: roughness of surface; the quality that grates on the ear; sourness; harshness.—**SYN.** of 'asperity': acrimony; animosity; tartness; harshness; moroseness; crabbedness; sourness; sharpness.

ASPERMOUS, a. *ā-spēr'mūs* [Gr. *a*, without; *sperma*, seed]: in *bot.*, without seed.

ASPERN, *ās'pĕrn*, or **GROSS ASPERN**: village of Austria. On the left bank of the Danube, 5 m. e.n.e. of Vienna. Pop. abt. 700.

This and the neighboring village of Essling are celebrated as the scene of a sanguinary battle in the summer of 1809, between the French army under Napoleon I. and the Austrians under Archduke Charles. After the battle of Eckmühl, in which the Austrians were defeated, the archduke retired to the left bank of the Danube, leaving the road to Vienna open to the French. The French army entered Vienna, 1809, May 12, when the archduke concentrated his forces on the opposite bank of the river. Napoleon threw bridges over the river, and on the 21st the French army began crossing to the attack. The Austrians at first seemed to give way; but when about half the French had crossed the river, they returned to the charge and almost surrounded the enemy in the narrow plain between the two villages. Here ensued the battle of A., a terrible conflict, the grand object of the contending hosts being the possession of the villages. At the close of the day, it remained undecided; but next morning it was renewed with fury on either side, when, after terrible slaughter Napoleon ordered a retreat, and his shattered ranks retired to the little island of Lobau, in the middle of the river, whence they afterwards slowly withdrew to the right bank. The loss on the side of the Austrians was given at 4,000 killed and 16,000 wounded; that of the French at double that amount. Marshal Lannes, the most daring among the French generals, was among the slain. Both the villages were reduced to heaps of ruins.

ASPERNATION, n. *ās-pēr-nā'shun* [L. *aspernatio*—from *ab*, from; *spernor*, to despise]: contempt; disdain.

ASPEROLITE, *as-pĕr'o-līt* [L. *asper*, rough; Gr. *lithos*, stone]: a variety of chrysocolla.(q.v.) It is a very brittle mineral, of a bluish-green color, found in Tagilsk, Russia.

ASPERSE, v. *ās-pĕrs'* [L. *aspersus*, besprinkled]: to sprinkle over; to cover all over with evil reports; to slander. **ASPERS'ING**, imp. **ASPersed**, pp. *ās-pĕrst'*, slandered. **ASPERS'ER**, n. -ēr. one who. **ASPERSION**, n. *ās-pĕr'shun*, a sprinkling, as with dust or water; the act of spreading foul and slanderous reports. **ASPERSORY**, a. *ās-pĕr'sĕr-ĭ*, defamatory. **ASPER'SIVE**, a. -sĭv, involving aspersions; calculated to asperse. **ASPER'SIVELY**, ad. by way of aspersion.—**SYN.** of 'asperse': to slander; detract; defame; calumniate; vilify; vilipend.

ASPERSORIUM—ASPHALT.

ASPERSORIUM, n. *ās-pēr-sō' rĭ-ŭm* [L.L. *aspersorium*; Ital. *aspersorio*]: the stoup, or holy-water basin, in mediæval churches; the aspergill (q.v.).

ASPERUGO, *ās-pēr-ŭ' gō* [L. a plant with prickly leaves—from *asper*, rough]: genus of plants belonging to the order *Boraginaceæ*. It contains only one species, *A. procumbens*, or German Madwort, a very hispid plant, with solitary blue flowers in the axils of the leaves.

ASPERULA: see WOODRUFF.

ASPETTI, *ās-pĕt'tē*, TIZIANO: 1565–1607: b. Padua; d. Pisa: sculptor, said to have been a nephew of the painter Titian. This, however, is doubtful, as Titian was born in 1477. A. worked at Venice, Padua, Florence, and Pisa. Vasari calls him the Titian of Padua, and praises his work highly. A statue of St. Anthony at Padua, and statues of Sts. Peter and Paul on the façade of St. Mark's Church at Venice, are among his works.

ASPHALT, or ASPHALTUM, n. *ās-fält'* or *ās-fäl' tŭm* [L. *asphaltum*; Gr. *asphaltos*, bitumen—from Gr. *a*, not; *sphallo*, I cause to slip]: a compact form of bitumen (q.v.); a blackish or dark-brown substance of solid consistence. ASPHALTIC, a. *ās-fäl' tĭk*, pertaining to asphalt. ASPHALTING, process of covering or of paving with asphaltum. ASPHALTOTYPE, negative photograph produced on a plate coated with a film of bitumen.—*Asphalt* appears to be the hardened form of more liquid bituminous substances, e.g., petroleum, which have oozed out of the ground. The largest natural deposit of A. is the Pitch Lake in the island of Trinidad (q.v.). A. is found also on the shores of the Dead Sea in large quantity. Artificial A. is made from gas-tar (q.v.). The various kinds of A. have a pitchy odor, when pure a resinous lustre, do not soil in handling; are insoluble in water, sparingly soluble in alcohol; but are in great part dissolved by ether, oil of turpentine, and naphtha, in which respect A. differs essentially from coal. *Petroleum* (q.v.) is essentially A. dissolved in naphtha. The specific gravity of A. is very near that of water, ranging from 1,000 to 1,100. A. was employed by the ancient Egyptians for embalming their dead, and was used in Babylon as mortar. Its modern applications are numerous. It is an ingredient in Japan varnish, and in the enamel on 'patent leather'; and is used with other materials to make waterproof roofing and flooring, linings for cisterns, and with pasteboard materials in construction of water-pipes. It is much used to form 'damp courses' in walls of buildings—i.e., a layer of it, $\frac{1}{2}$ inch to $\frac{3}{4}$ inch thick, is spread over the thickness of a wall near the ground-level, to prevent ascent of damp; and frequently the whole internal ground area of a house is covered with a layer of A. Where a house-wall is against a bank of earth, the whole surface is protected from damp by a lining of it. Timber for use in constructions under water is made more durable by saturation with A. heated. One or two kinds of A., such as those found at Seyssel in e. France, and at Val-de-Travers in Switzerland, are really bituminous limestones: the latter is known all over the world as a material for pavement (q.v.). This Val-de-

ASPHALTIC COAL.

Travers A. is prepared by reducing the natural rock, which contains 7 to 20 per cent. of bitumen, to powder, and then putting it with some melted bitumen into a caldron. After being fused and stirred for some time, it is run into molds to form blocks of about 1 cwt. each. These blocks are called 'asphaltic mastic,' and the finest kinds contain 87 per cent. of carbonate of lime and 13 of bitumen, and should not melt below 168° F. It has, especially since 1854, been extensively used in paving streets on the European continent, and foot-ways in British cities. In the United States, the A. used is mostly made of refuse tar from gas-works, mixed with slaked lime and gravel (see GAS-TAR). The *pigment* known as asphaltum is prepared sometimes from natural A., but usually from the residue of distilled bituminous substances. Unfortunately, its fine transparent brown color has tempted some distinguished modern artists to use it largely. Through its property of not drying thoroughly and free of cracks, several fine pictures painted years ago by Horace Vernet, Sir George Harvey, and others.

The production of asphaltum and bituminous rock in the U. S. 1901 amounted to 63,134 short tons, value \$555,335. The varieties are technically known as bituminous sandstone, bituminous limestone, mastic, hard and refined or gum, and liquid or maltha. The importation of crude A., chiefly from Trinidad, was 138,833 long tons, value \$553,473. The U. S. production of liquid asphaltum or maltha is wholly in Cal.

ASPHALTIC COAL: a substance resembling coal, found in the cavities of the older rocks, and supposed to have been deposited in a liquid or plastic state. There are many varieties, differing in composition and reactions, so that A. C. is not a species, but a general name. One is Albertite (q.v.); another, Grahamite, in W. Virginia; another, Uintahite, in Utah; so, also, Cloustonite, Orkney, etc. They are not true coal, but supposed to be derived from inspissated mineral oil, and some occur in fissures.

ASPHODEL.

ASPHODEL, n. *ās fō-dēl* [Gr. *asphōd'ēlōs*, a plant sacred to Proserpine, daffodil]: a general name for certain hardy perennial plants, the yellow and white being common garden flowers; the day-lily, called also the king's spear; properly *Hemērōcāl'lis* is the day-lily, and *Asphōd'ēlus alba* is the common garden plant, formerly called king's spear—both of *Liliācēæ*: this genus of plants has by many botanists been made the type of a nat. ord. *Asphodeleæ*; now, however, it is generally regarded as forming part of the order *Liliaceæ*. The *Asphodeleæ* are either fibrous-rooted or bulbous-rooted. Among the latter are onions, hyacinths, squills, star of Bethlehem, etc.; among the former, asparagus, A., etc. The roots of the asphodels are



White Asphodel.

fleshy and thick. The species are not very numerous, and are natives mostly of the countries around the Mediterranean Sea. The Yellow A. (*A. luteus*) and the White A.

ASPHYXIA.

(*A. albus*) have long been known and prized as garden flowers. The yellow *A.* has an unbranched stem 2–3 ft. high, much covered by the sheathing bases of the long narrow leaves. The leaves of the white *A.* are all radical, and its flowers are in branched clusters. Both species flower about the time when spring passes into summer.

ASPHYXIA, n. *ās-fík'sī-ă*, or ASPHYXY, n. *ās-fík'sī* [Gr. *asphuxiā*, the stopping of the pulse—from *a*, without; *sphuxis*, the pulse—*lit.*, pulselessness]: the temporary or permanent cessation of the motions of the heart as in drowning and suffocation, due to the want of air, or the presence of irrespirable gases. ASPHYXIATE v. *ās-fíks'ī-āt*, to suffocate, as in drowning, or by breathing the fumes of certain burning substances. ASPHYX'IA'TING, imp. ASPHYXIATED, pp. a. *ās-fíks'ī-ā'tēd*, suffocated as by hanging or drowning, or by an accumulation of carbonic acid in the blood.

ASPHYXIA, *ās-fík'sī-ă*, or ASPHYXY, *ās-fík'sī*: term usually applied to the condition resulting from the blood in the body no longer being brought into the proper relations to the atmospheric air by respiration, so as to allow a sufficiently free exchange of carbonic acid for oxygen. See RESPIRATION. *A.* may result from several causes. No air, or but a scanty supply, may be admitted, as in strangulation, drowning, choking, or disease in the windpipe; the chest may be prevented from expanding either from a superincumbent weight or paralysis, as when a man breaks the upper part of his neck above the phrenic nerve, thus paralyzing the diaphragm; again, although there may be every capacity for respiration, the air itself may be in fault, and contain too little oxygen in proportion to other elements, such as carbonic acid or sulphuretted hydrogen, which when inhaled act as poisons. Aquatic animals may be asphyxiated either by depriving of oxygen the water that they inhabit, or by impregnating it with the gases above mentioned.

As the condition of *A.* advances, in drowning or otherwise, the small vessels of the lungs become gorged with blood, which the heart no longer has power to force freely through them, the right side of the heart and pulmonary artery become filled with blood, while but little returns to the arterial or left side of the heart.

The person becomes pallid, except in such vascular parts as the lips, cheeks, and finger-tips, which become blue; and soon the blood, no longer aerated, produces the phenomena of poisoning by carbonic acid. After some slight convulsive movements the person becomes insensible, the pulsations of the heart grow gradually feebler, and at last cease altogether. In man this occurs in from a minute and a half to five minutes. Some persons, as the Ceylon divers, can by habit do without a fresh supply of air for a longer period; and some diving animals have an arrangement of blood-vessels by which they are enabled to be under water for a long time. Restoration of asphyxiated persons may be attempted with hopes of success at a very long period after apparent death. The object of all meth-

ASPHYXIANTS—ASPINWALL.

ods is, of course, to fill the lungs with fresh air. One of the most efficient is that of the late Marshall Hall: Lay the person down at once with his head on his left arm, open the mouth, and draw the tongue forward, then roll him gently over towards the left till he is nearly quite over on his face, then on to his back again, making the body by its own weight compress the chest, which, on expansion by its elasticity, fills with air. Repeat this about 15 times in a minute. This remedy nearly superseded all others for the restoration of still-born infants and other asphyxiated persons, before the introduction of the method of Dr. Sylvester, an account of which is given under RESPIRATION, ARTIFICIAL.

ASPHYXIANTS: chemical substances enclosed in shells or other projectiles, which when set free produce a suffocating and poisonous effect. The French secretly made experiments with asphyxiating shot at Brest in 1851. The principle of these missiles seems to have been to carry into an enemy's ship the means of generating deadly gases which would suffocate the crews between decks. Scientific artillerists dread and discountenance these novelties; they have learned to regard war almost as a mathematical science, or, at any rate, as an elaborate application of such science; and they see nothing but savage cruelty in the 'diabolical chemistry' of asphyxiants. Gen. Sir Howard Douglas, in a late edition of his *Naval Gunnery*, says: 'The author learns, with great regret, that some awful experiments have been made with fearful success, in the royal arsenal, with asphyxiant projectiles, combining in a frightful degree incendiary with suffocating effects.' The Earl of Dundonald, Capt. Norton, Mr. Macintosh, and many other inventors, some years ago brought asphyxiating compositions to the notice of the English admiralty and War-office; and the French arsenals were known to possess many such in store. Some of these compositions are liquids which burn fiercely, and ignite wood and canvas readily; some are contained in shells which, on bursting, scatter the suffocating and burning substances all around; and some assume other forms.

ASPIC, n. *ās'pīk* [F. *aspic*: Eng. *spike*, lavender-spike, corrupted from OF. *espīc*: L. *spīcus*, lavender]: savory jelly extracted from meat, as calves' feet, veal, ham, etc., together with onions, carrots and savory herbs, flavored with wine, liquors, etc.

ASPIC: see ASP 1.

ASPIDIUM: see FERN, MALE.

ASPIDOPHORUS, *ās-pīd-ŏf'ēr-ŭs* [Gr. *aspis*, a small, round shield; *phoros*, carrying]: genus of fishes of old order *Acanthopterygii* and the family with hard cheeks. (Cuvier).

ASPIDORHYNCHUS, n. *ās'pī-dō-rīng'kŭs* [Gr. *as'pīda*, shield; *rhynchos*, a beak]: a genus of fossil fishes characterized by the tapering or beak-like prolongation of their upper jaws, armed with numerous sharp-pointed conical teeth.

ASPINWALL, *ās'pīn-waul*: town in Colombia, virtually a colony of the United States; at the Atlantic ex-

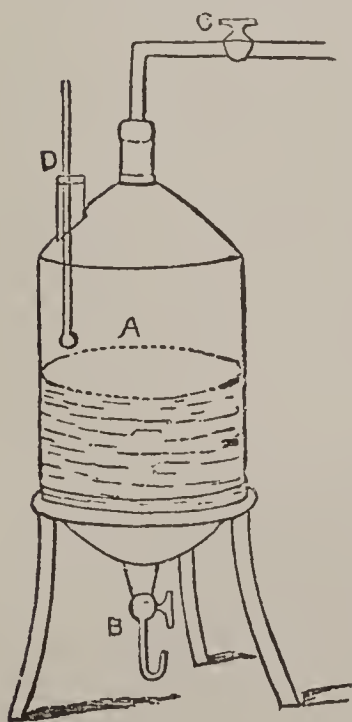
ASPIRATE—ASPIRATOR.

tremity of the Panama railway, and of the interoceanic canal in progress; about 8 m. to the n. of the old Spanish port of Chagres, 49 m. from Panama, and equidistant from the great trading capitals of Valparaiso and San Francisco. From its commanding position as a place of transit, A. is one of the busiest and most prosperous towns in the new world. It monopolizes the benefits of the traffic in both directions, to the almost utter exclusion of the rapidly decaying Panama. The climate of A., formerly very unhealthy, has been greatly improved by drainage. A. derives its name from Mr. Aspinwall, the originator of the Panama r.r. *Colon* is the P. O. name: A. is not recognized.

ASPIRATE: name given to the letter *h* in grammar, as marking, not an articulate sound, but a *breathing*. It is applied also to a class of consonants. There is felt at once to be a relation, accompanied by a difference, between *p* and *f*, *t* and *th*, etc. To express the difference, the Greeks called the first of such a pair *psilon* (bare), the second *dasu* (rough); the Latin grammarians adopted the terms *lene* and *aspirate*, probably from the erroneous notion that the difference consists in the addition of the sound of *h*. There being no sound and no character in Latin corresponding to the Greek *θ* (*theta*), the Romans represented it by *th*; and this misleading expedient is continued for representing this aspirate and several others in all the alphabets derived from the Roman. According to some, the word ought to be *asperate*, i.e., 'roughened.' Of the sixteen mutes in a complete system (see LETTERS), eight are lene, each having its corresponding aspirate.

Lene— *p, b, t, d, k, g, s, z.*
Aspirate—*f, v, th(in), th(ine), ch, gh, sh, zh.*

In the corresponding words of allied languages, nothing is more common than the interchange of an aspirate and lene: Ex., Lat. *pater*, Eng. *father*; Gr. *thura*, Ger. *thür*, Eng. *door*; Lat. *cap(ut)*, Fr. *chef*, Eng. *chief*; Ger. *weib*, Eng. *wife*. Aspirated letters are also frequently interchangeable with one another: thus, Gr. *ther*, a wild beast, is in Lat. *fera*: Lat. *facere*, to do, becomes in Span. *hacer*.



Aspirator.

introduced at D. In working, the apparatus is filled

ASPIRA'TOR: apparatus employed to draw air or other gases through bottles or other vessels. It is of great use in the examination of gases by the analytic chemist. The simplest form is that represented in the figure, where A. is a large vessel capable of being filled with water, having a tube with stop-cock at B, a second tube with stop-cock at C, and a thermometer

ASPIRE--ASPLENIUM.

with water; the tube C is attached to the vessels through which the gas is to be drawn; and the stop-cocks at C and B being opened, the weight of the water escaping at B acts as suction, and draws in the gas from the tube C and the attached bottles or other vessels. The thermometer at D denotes the temperatures of the water, and subsequently gas, contained in the reservoir, while the upright turn of the tube B keeps any air from entering the reservoir by that route.—A more complicated form of A., but much more convenient to experiment with, is that known as Brannner's A.; the principle of action, however, is the same.

ASPIRE, v. *ās-pīr'* [F. *aspirer*—from L. *aspīrārē*, to breathe or blow towards—from *ad*, *spīro*, I breathe—*lit.*, to breathe towards]: to desire with eagerness; to pant after; to aim at something that can be obtained with difficulty. ASPIRING, imp.: ADJ. ambitious: N. the desire of something great. ASPIRED, pp. *ās-pīrd'*. ASPIRER, n. one who. ASPIRINGLY, ad. *-lī*. ASPIRANT, n. *ās-pī'rānt*, one who seeks with eagerness. ASPIRATE, v. *ās'pī-rāt* [L. *aspīrātus*, breathed towards]: to pronounce with a full breath: N. a letter with a mark to show it must be pronounced with a full breath: ADJ. pronounced with a breathing. ASPIRA'TING, imp. ASPIRATED, pp. *ās'pī-rā'tēd*. ASPIRATION, n. *ās'pī-rā'shūn* [F.—L.]: the act of pronouncing a letter with a full breath; an ardent wish or desire to attain. ASPIRA'TOR, n. *-rā'tēr*, an apparatus employed by chemists for drawing air or a gas through bottles. ASPIRATORY, a. *ās-pī'rā-tēr'ī*, pertaining to breathing.

ASPIS, *ās'pīs*, or CLUPEA, *clū'pe-a*: an ancient town situated on the Mediterranean, abt. 50 m. e. of Carthage, to which it belonged. It was fortified and had an accessible harbor. In the first Punic war, Manlius and Regulus landed at A., and in the third war it sustained a siege. It is also mentioned in connection with the Julian civil war. From A.D. 411 to 646, it was an important bishopric, and was the last place in Africa where the Christians resisted the Moslems.

ASPIS: a governor under Artaxerxes, in the neighborhood of Cappadocia. Having incited the country to revolt, he was captured by Datames, and was put to death.

ASPLENIUM, *ās-plē'nī-ŭm*: genus of Ferns, of the ord. or sub-ord. *Polypodiaceæ*. The species are numerous, and widely diffused in both the northern and southern hemispheres. Many of them are of great beauty; and the small size of some recommends them to cultivators of ferns who have limited space. Some of the species bear the English name *Spleenwort*, as *A. Trichomanes*, *A. viride*, *A. Adiantum-nigrum*, etc., having been formerly supposed efficacious in removing obstructions of the viscera. From the same circumstance the name A. [Gr. *a*, privative, and *splen*, the spleen] is derived. They have now fallen completely into disuse, but were at one time very much employed, chiefly in the form of a syrup like *Capillaire* (q.v.),

ASPORTATION—ASQUITH.

and were administered not only in cases of cough, asthma, diseases of the liver, and cutaneous diseases, but even in stone and gravel. But perhaps none of them was so extensively used as the species which is styled in old books Common Spleenwort (*A. Cet'erach*), now the type of a distinct genus, and known as *Cet'erach officinarum*. The genus *A.*, in our species, has the spore-clusters (*sori*) long, on the inner side of the unbranched veins, oblique to the midrib of the leaf-lobe—rarely on both sides. There are nine species in e. and central United States, of which *A. Trichomanes* is one of the most common, with tufts of slender leaves.

ASPORTATION, n. *ās'pōr-tā'shūn* [L. *asportātīōnem*, a carrying or taking away—from *ab*, from; *porto*, I carry]: act of carrying or conveying away.

ASPREDO, *ās-prē'dō* [L. *aspredo*, roughness]: genus of fishes of the sub-class *Teleostei*, order *Teleocephali*, and family *Siluridae*. They are the only known fishes which have no mobility in the operculum. They have six or eight barbels. They are akin to the famous Electric *Silurus* or 'eel' of the Nile and Senegal rivers.

ASPRO, *ās'prō* [Gr. *aspros*: L. *asper*, rough]: genus of spiny-finned fishes belonging to the Perch family. They live in the Rhone, Danube, and other rivers.

ASPROMONTE, n. *ās-prō-mōn'tē*: a mountain in s.w. Italy, near which, 1862, Aug. 28, a battle took place between Garibaldi's troops and those of Pallavicini. During the fight, Garibaldi was wounded and captured. He was afterward sent to Caprera. *A.* is near Reggio.

ASPROPOT'AMO: see ACHELOUS.

ASQUINT, ad. *ā-skwīnt'* [Dut. *schuinte*, a slope, obliquity (see ASKANCE)]: toward one side; obliquely.

ASQUITH, HERBERT HENRY: English statesman: b. Morley, England, 1852, Sep. 12; son of J. Dixon A. He was educated at the City of London School, and at Balliol Coll., Oxford, of which he was scholar, and afterward fellow, receiving his degree B.A., 1874. He studied law, was called to the bar at Lincoln's Inn 1876, June, and appointed queen's counsel 1890, Feb. In 1886 A. was elected member of parliament for East Fifeshire. He was engaged as one of the counsel for Charles S. Parnell in the trial before the 'Parnell Commission,' 1888-90; he also appeared in the celebrated 'baccarat' trial, 1891. He was appointed home sec. in Gladstone's cabinet, 1892, Aug. 16. He married, 1877, Helen, daughter of F. Melland, of Manchester, England.

ASS.

ASS, n. *äs* [L. *asinus*, an ass; Icel. *asni*: W. *asyn*: Ger. *esel*: Pol. *osiol*, an ass]: a well-known beast of burden, dull and slow, but patient and hardy; a dull, stupid person. ASININE, a. *äs'ĩ-nĩn*, pertaining to an ass; like an ass. ASSES' BRIDGE, Proposition V. Book I. of Euclid's Geometry, being the first difficult proposition.

ASS (*Equus Asinus*): a well-known quadruped, usually referred by naturalists to the same genus as the horse (q.v.): though there are recent attempts to make it a type of a distinct genus (*Asinus*), including all the solid-hoofed quadrupeds (*Solidungula* or *Equidae*, see HORSE) except the horse itself. The distinction is founded on the short hair of the upper part of the tail and the tuft at the end of it, the darker stripes with which the color is marked, and the absence of the hard horny warts which are found on the hinder-legs of the horse, although the fore-legs exhibit warts in a similar position. The long ears of the A. are one of the characteristics of the species, but they are longer in domestication than in a wild state. It is usually also distinguished by a black cross over the shoulders, formed by a longitudinal and a transverse streak, the general color being gray; but when the general color is darker or lighter than usual, the cross is often less apparent, or observed with difficulty. The facial line is arched.

Some uncertainty still exists as to the origin of the domestic A.; a number of wild races having been described, some of which are perhaps, like the wild horses of America, the progeny of animals that have escaped from domestication. The probability, however, appears to be that the A. is a native of Central Asia, where it is found in a perfectly wild state, in Tatary, Mesopotamia, Persia, etc., on the banks of the Indus, and even to the s. extremity of Hindustan; but its range does not extend so far n. as that of the wild horse—which may perhaps partly account for the inferiority of the domestic A. in northern climates. The wild A. is found both in mountainous districts and in plains; vast troops roam over the great Asiatic deserts, migrating according to the season, in summer, as far n. as the Ural; in winter s. to the borders of India. It is fond of bitter and saline herbage, and of brackish water. It was first accurately described by Pallas, under the name *Koulán*, which it bears on the high steppes around the Caspian Sea. It was, however, well known to the ancients, and is called *Onager* and *Asinus sylvestris* by Pliny, who also mentions under the name of *Hemionus*, another species (*Equus Hemionus*), native of the same regions, now called the *Kiang*, or the *Dziggethai*. The latter name appears to be of Turkish origin, and to signify Mountain A., but seems to be sometimes applied to one of these species and sometimes to the other. This seems also to be the case with some of their other eastern names, as *Khur* or *Goor*, and is a source of no little confusion.—The cross on the shoulders is less observable in the *Koulán* than it usually is in the domesticated A. In one remarkable particular, the domesticated A. agrees with the *Equus Hemionus*, and differs from the *Koulán*, the infra-orbital

ASS.

foramen of the skull being situated much lower. But the Kiang neighs like a horse, and the other *brays*. The harshness of the voice of the A. is ascribed to two small peculiar cavities situated at the bottom of the larynx.

The allusions to the wild A. in the Old Testament, particularly Job xxxix., naturally excite the surprise of readers acquainted only with the dull domestic drudge, the emblem of patience and stolidity; but to this day they are beautifully appropriate to the wild A. of 'the wilderness,'



The Wild Ass.

which has the 'barren land' or 'salt places' for its dwelling, and the 'range of the mountains' for its pasture.—The wild A. has a short mane of dark woolly hair, and a stripe of dark bushy hair runs along the ridge of the back from the mane to the tail. It has longer legs, and carries its head higher than the domestic A. Its troops have always a leader. It is a high-spirited animal, very fleet

ASSAB—ASSAI.

and very wary, trying to the utmost the powers of the hunter. It is a principal object of the chase in Persia, where its flesh is prized as venison is in Europe, and it is accounted the noblest of game. Xenophon, in his *Anabasis*, describes the wild A. as swifter of foot than the horse, and its flesh as like that of the red deer, but more tender.

The domestic A., also in Arabia, Persia, Syria, and other eastern countries, is a much finer animal than as it is usually seen in Europe, except in Spain, Italy, and Malta, where it is treated better, and is more highly valued. In the east, where it was formerly chosen by the rich and the great, it is still used for riding. It was one of the earliest animals domesticated, but its introduction to n. Europe is comparatively recent. Though sometimes used for light work, the A. is kept in the U. S. principally for raising mules (see MULE). Ky., Tenn., Ill., and Mo. are among the states in which asses are most largely bred. The first valuable stock brought to this country arrived 1787, in which year Gen. Washington, who was interested in breeding mules, received a male and two females from the king of Spain, and a Maltese male and female from Gen. Lafayette. The A. can be kept on much cheaper food than the horse, and is less liable to diseases and accidental injuries. Though commonly regarded as obstinate and stupid, it is, when well bred and kindly treated, both docile and intelligent.

There are two hybrids between the A. and the horse—the MULE (q.v.), bred between the male A. and the mare; and the HINNY (q.v.), the offspring of the horse and the female A.

The milk of the A. contains more sugar of milk and less caseine than that of the cow, and is therefore recommended as a nutritious diet in cases of weak digestion. Its usefulness in cases of consumption has been long known, and it was often prescribed as a kind of specific when that disease was treated on principles very different from those which regulate its treatment now, and when very nutritious food was not usually prescribed to consumptive patients.

The leather called shagreen (q.v.) is made by a peculiar process from the skin of the A., which also affords excellent leather for shoes, and the best material for drums. The bones of the A., which are very solid, were used by the ancients for making flutes.

ASSAB, *ās-sāb'*: Italian trading station on the w. coast of the Red Sea, near Bab-el-Mandeb. It was first acquired by a private company of Italians, but passed into the possession of the government of Italy, 1881.

ASSAFŒTIDA: see ASAFETIDA.

ASSAGAY, or ASSAGAI, better spellings of ASSEGAI—which see.

ASSAI, ad. *ās-sá'í* [It. *assai*: Fr. *assez*, enough—from L.

ASSAI—ASSAL.

ad, to; *satis*, enough]: in *mus.*, very; as *largo assai*, very slow.

ASSAI, *ās-sī'*: a beverage much used on the Amazon, prepared from palms nearly allied to the Cabbage



Assai Palm (*Euterpe oleracea*).

Palm (q.v.). The most common species of A. palm is 60 ft. high, with a smooth stem about four inches in diameter. The fruit is small, in size and color resembling sloes, but is produced in great quantity upon branched *spadices*, which are thrown out horizontally beneath the crown of leaves. It consists of a hard seed, with a very thin covering of a firm pulp or flesh. The tree grows in swamps flooded by the high tides. Boys climb the trees for the fruit, upon which warm water is poured, and by rubbing and kneading, a liquid is procured, consisting simply of the pulp of the fruit and water, which is constantly vended in the streets of Pará, and of which the inhabitants are extremely fond. This is A. It is a thick, creamy liquid, of a purplish color, and a flavor like that of a freshly gathered nut. It is commonly used along with the bread made from Manioc (q.v.), called *farinha*, and either with or without sugar. Half the population of Pará make a daily meal of A. and *farinha*; and upon this hundreds are said chiefly to subsist. The stem of the A. palm is something used for poles and rafters, and its terminal bud as a

cabbage or as a salad with oil and vinegar, but it is too much valued for its fruit to be often cut down for these purposes.—Another species, *Euterpe Catinga*, is found in forests of a dry sandy soil and very peculiar vegetation, known as Catinga forests. The beverage made from it is sweeter than the common kind, but the produce of the tree is much smaller.

ASSAIL, v. *ās-sāl'* [F. *assaillir*, to assault—from mid. L. *assailirē*, to assault—from L. *ad*, to; *salīō*, I leap]: to leap or fall upon by violence; to attack with a view to overcome or injure, as in words or writing. ASSAIL'ING, imp. ASSAILED, pp. *ās-sāld'*. ASSAILABLE, a. *ās-sāl'ā-bl*, that may be attacked. ASSAILANT, n. *ās sāl'ānt*, or ASSAIL'ER, one who assails or attacks. ASSAIL'ANT, a. assaulting; attacking. —SYN. of 'assail': to attack; assault; encounter; invade.

ASSAL, *ās-sāl'*: salt lake in the e. of Africa, 25 m. s.w. of Tajurrah, the chief seaport of Adel; lat. 11° 40' n., long. 42° 40' e. Its length is 8 m.; its breadth, 4 m. It lies in a land remarkable for its wild, waste, and sterile character.

ASSAM—ASSART.

A. is enclosed on all sides but the e. by hills, and is nearly 700 ft. below the level of the sea. Abyssinian caravans resort to it for the purpose of carrying off the salt which incrusts its shores like ice, sometimes to the depth of half a foot. It has been supposed that it was at one time connected with the Bay of Tajurrah.

ASSAM, *ās-sām'*: province at the n.e. extremity of Brit. India; lat. 23°–28° n., long. 89°–97° e.; 49,004 sq. m.; divided into 13 dists.; principal towns, Gauhati and Sylhet; seat of govt., Shillong. It forms part of the basin of the Lower Brahmaputra, and from that and about 60 other rivers derives exceptional drainage and irrigation. In 1890–1 it had 2,676,271 acres under cultivation, 8,922,310 not cultivated, and 2,358,558 in forests; and of the acreage under cultivation, 1,275,144 were in rice, 230,822 in tea plants, 167,606 in oil seeds, 58,295 in food grains excepting rice, and 17,830 in sugar-cane. There were 722,150 estates, with gross area 7,659,023 acres. Other products are gold, ivory, iron, lead, petroleum, coal, mustard, and musk; the tea crop is usually about three-fourths of the total production in India. Chief imports are woollens, India fabrics, salt, opium, glass, earthenware, tobacco, and betel. One of the most striking features of A. is the abundance of wild animals, such as tigers, rhinoceroses, leopards, buffaloes, and elephants. Of elephants, not less than 500 are annually caught; and, when tamed, bands of them may be seen, harmless as cows, in the charge of a single attendant. The forests teem with game, and the rivers with fish. The province has steamboat communication with Calcutta, Dibrugarh, and intermediate points; and railway traffic with Calcutta, Dhoobri, and towns between. Of the pop. by 1901 census, 3,429,459 were Hindus, 1,581,317 Mohammedans, 1,068,334 Animistic, and 35,969 Christians. Education was under encouraging development. The revenue in year ending 1891, Mar. 31, was Rx. 1,027,214; expenditure Rx. 698,480.—In 1826, at the close of the first Burmese war, A. was ceded to the British. The upper portion of the province was, however, under a native rajah till 1838, when, in consequence of his misgovernment, the entire country was placed under Brit. administration. The native state of Manipur, where the Brit. resident and the chief commissioner of A. were massacred, 1891, is subordinate to A.—Pop. (1881) 4,881,426; (1891) 5,476,833; (1901) 6,126,343.

ASSAMAR, n. *ās'sa-mâr*: in *chem.*, a bitter substance contained in the brown oil obtained by the destructive distillation of cane sugar.

ASSARIUS, n. *as-sâr'î-ūs* [L. *assarius*: Gr. *assarion*—both from L. *as*, a Roman coin]: in classic times, a coin worth nearly two cents. In Matt. x. 29 it is translated penny.

ASSART, n. *ās-ârt'* [mid. L. *assar'ta*: F. *essart*, land cleared of wood by having the trees grubbed up]: in *OE.*, parts of forests cleared of wood and made arable in law the crime of cutting down forest wood.

ASSASSINS.

ASSASSIN, n. *ās-sās'sīn* [Ar. *hashishin*, drug-eaters—viz., of blang or extract of hemp—from *hashish*, the intoxicating preparation of the hemp: F. *assassin*]: one of a famous eastern sect of professional murderers, called assassins, stimulated thereto by the use of extract of hemp; one who kills, or attempts to kill, by surprise or by secret attack. **ASSASSINATE**, v. *ās-sās'sī-nāt*, to kill, or to attempt to kill, by surprise; to murder by a secret attack. **ASSAS'SINA'TING**, imp. **ASSAS'SINA'TED**, pp. *-nā'tēd*. **ASSASSINATION**, n. *ās-sās'sa-na'shūn*, the act of murdering by secret violence or by surprise. **ASSAS'SINA'TOR**, n. *-sī'-nā'tēr*, a murderer by surprise.—**SYN.** of 'assassinate': to kill; murder; slay; slaughter.

ASSASSINS: a military order, branch of the secret sect of the Ismailis (q.v.). The secret doctrines of these Ismailis, who had their headquarters in Cairo, declared the descendants of *Ismael*, the last of the seven so-called imamuhs, to be alone entitled to the caliphate; and gave an allegorical interpretation to the precepts of Islam, which led, as their adversaries asserted, to considering all positive religions equally right, and all actions morally indifferent. The atrocious career of the A. was but a natural sequence of such teaching. The founder of these last, Hassan-ibn-Sabbah-el-Homairi, of Persian descent, and imbued with the free-thinking tendencies of his country, had, about the middle of the 11th c., studied at Nishapur, under the celebrated Mowasek, and had subsequently obtained from Ismaili *dais*, or religious leaders, a partial insight into their secret doctrines, and a partial consecration to the rank of dai. But on betaking himself to the central lodge at Cairo, he quarrelled with the heads of the sect, and was doomed to banishment. He succeeded, however, in making his escape from the ship and reaching the Syrian coast, after which he returned to Persia, everywhere collecting adherents, with the view of founding, upon the Ismaili model, a secret order of his own, a species of organized society which should be a terror to his most powerful neighbors. In 1090, Hassan conquered the fortress of Alamut, in the Persian district of Rudbar; and continued to increase in strength, intimidating princes and governors by a series of secret murders, and gaining possession of several fortified castles, with their surrounding territories, both in the mountain ranges of the Caspian, in Kuhistan, and in the mountains of Syria (Massiat). The internal constitution of the order, which had some resemblance to the orders of Christian knighthood, was as follows: First, as supreme and absolute ruler, came the Sheikh-al-jebal, the Prince or Old Man of the Mountains. His vicegerents in Jebal, Kuhistan, and Syria were the three Dai-al-kirbal, or grand-priors of the order. Next came the Dais and Refiks, which last were not, however, initiated, like the former, into every stage of the secret doctrines, and had no authority as teachers. To the uninitiated belonged, first of all, the Fedavis, or Fedais—i.e., the devoted; a band of resolute youths, the ever ready and blindly obedient executioners of the Old

ASSAULT.

Man of the Mountain. Before he assigned to them their bloody tasks, he used to have them thrown into a state of ecstasy, by the intoxicating influence of the *hashish* (the hemp-plant), whence the order was called Hashishin, or hemp-eaters. The word was changed by Europeans into Assassins, and transplanted into the languages of the West with the signification of murderers. The Lasiks, or novices, formed the sixth division of the order, and the laborers and the mechanics the seventh. Upon these, the most rigid observance of the Koran was enjoined; while the initiated, on the contrary, looked upon all positive religion as null. The catechism of the order, placed by Hassan in the hands of his dais, consisted of seven parts, of which the second treated, among other things, of the art of worming themselves into the confidence of men. It is easy to conceive the terror which so unscrupulous a sect must have inspired. Several princes secretly paid tribute to the Old Man of the Mountains. Hassan, who died, 1124, at the age of 70, appointed as his successor Kia-Busurg-Omid, one of his grand-priors. Kia-Busurg-Omid was succeeded in 1138 by his son Mohammed, who knew how to maintain his power against Nureddin and Jussuf-Salaheddin. In 1163, Hassan II. was rash enough to extend the secret privilege of the initiated—exemption, namely, from the positive precepts of religion—to the people generally, and to abolish Islam in the Assassin state; which led to his falling a victim to his brother-in-law's dagger. Under the rule of his son, Mohammed II., who acted in his father's spirit, the Syrian dai-al-kebir, Sinan, became independent, and entered into negotiations with the Christian king of Jerusalem for coming over, on certain conditions, to the Christian faith; but the Templars killed his envoys, and rejected his overtures, that they might not lose the yearly tribute which they drew from him. Mohammed was poisoned by his son, Hassan III., who reinstated Islamism, and thence obtained the surname of the New Moslem. Hassan was succeeded by Mohammed III., a boy of nine years old, who, by his effeminate rule, led to the overthrow of the order, and was eventually murdered by the command of his son, Rokn-cddin, the seventh and last Old Man of the Mountains. In 1256, the Mongolian prince, Hulagu, burst with his hordes upon the hill-forts of Persia, numbering about a hundred, held by the Assassins, capturing and destroying them. The Syrian branch also was put down about the end of the 13th c., but remnants of the sect lingered for some time longer in Kuhistan. In 1352, the A. reappeared in Syria, and indeed they are still reported to exist as a heretical sect both there and in Persia. The Persian Ismailis have an imaum, or superintendent, in the district of Kum, and still inhabit the neighborhood of Alamoot under the name of Hosseinis. The Syrian Ismailis live in the district of Massiat or Massyad. Their castle was taken from them in 1809 by the Nossaris, but afterwards restored. See Hammer, *Geschichte der Assassinen* (Stutt. and Tüb. 1818); Guyard, *Fragments* (1874).

ASSAULT—ASSAULT AND BATTERY.

ASSAULT, n. *ās-sawlt'* [OF. *assalt*: F. *assaut*, an assault—from L. *assal'tus*, leaped upon—from L. *ad*, *saltus*, a leaping (see **ASSAIL**)]: an assailing or setting upon; a violent or hostile attack; in *mil.*, the act of attempting to capture a town, etc., by main force: V. to fall upon with violence; to attack in words or writing. **ASSAULT'ING**, imp. **ASSAULTED**, pp. *ās-sawlt'ēd*. **ASSAULT'ER**, n. one who. **ASSAULT'ANT**, n. an assailant: **ADJ.** leaping upon; assailing. **ASSAULTABLE**, a. *ās-sawlt'ā-bl*, that may be assailed or assaulted.—**SYN.** of 'assault, v.': to attack; assail; encounter; invade; storm; charge:—of 'assault, n.': invasion; attack; incursion; onset; descent; storming; charge; onslaught.

ASSAULT: sudden and violent attack. In A. on a fortified post, the troops are told off into 'storming-parties,' 'supports,' and 'firing-parties.' The storming-parties are those who take the most terrible duty, being that of making a forcible entry into the place. The firing-parties or musketeers seek to shield the storming-parties as much as possible from the fire of the enemy; they spread themselves out in extended order, to keep down the fire of the garrison—aiming at any soldier who may show his head above the parapet, and seeking to disable the artillerymen by firing into the embrasures. Many assaults are made by *surprise*; and in that case the storming and firing parties order all their preliminary movements as quietly as possible. In most cases, there is a necessity for the stormers to descend into a dry ditch, and to ascend from the ditch to a breach or a gate in the fortified wall. To aid in this duty, 'ladder-parties' are placed at the disposal of the storming-parties; these men have previously been practiced in carrying scaling-ladders, descending and ascending ditches, and adjusting the ladders. In some celebrated sieges, ladders 40 ft. long have been used, where the ditch was deep and the wall or bastion high; but it is seldom that a storming-party could venture on so perilous a work, for the men crowded on such a ladder would endanger each other. The 'supports' are troops who keep a little in the rear of the storming and firing parties.

ASSAULT AND BATTERY (see **BATTERY**), in Law: the crime of violently attacking, or of offering to do corporal hurt to another. Under *Assault* are involved the offenses of *battery*, *beating and wounding*, and *mayhem*, since it is implied in them all. The above offenses all involve an actual attack on, and injury to, the person of the party assaulted. But there may be an assault without such actual hurt. Violence or force is not a necessary element in this offense, but the least touching, however trifling, of another's person in an angry, rude, insulting manner, is a battery; for the law, says Blackstone, cannot draw the line between different degrees of violence, and therefore totally prohibits the first and lowest stage of it, every man's person being sacred, and no one having a right to meddle with it in any the slightest manner. The remedy for an injury of this kind may be either by a civil action, as for

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damages, or by indictment, as for a misdemeanor. Where the battery is on a married woman, her husband may sue for damages by action of trespass; if the maltreatment be so serious as to have deprived the husband for any time of his wife's company, the law then gives him a separate remedy, by an action in which he may recover special damage, on the ground of the loss of his wife's society while she was suffering from the beating.

Assault without actual hurt or violence is a *common assault*, and hence in criminal law, assaults are distinguished by their being *common* or *aggravated*. A common assault has been defined as an attempt or offer to do a corporal hurt to another, as by striking at another with a stick or weapon, though the party striking misses his aim. The principle is, that it is sufficient, in order to constitute such an offense, that there has been such an exhibition of a violent and offensive *animus* as to show at once the intention, and the power, to commit it. So, drawing a sword or bayonet, or even holding up a fist in a menacing manner, throwing a bottle or glass with intent to wound or strike, presenting a gun at a person who is within the distance to which the gun will carry, pointing a pitchfork at a person who is within reach, or any other similar act, accompanied with such circumstances as denote at the time an intention, coupled with a present ability, of using actual violence against the person of another, will amount to an assault.—Russell on *Crimes and Misdemeanors*, vol. i. p. 750. It has even been laid down, that to present a pistol, purported to be loaded, so near as to produce danger to life if the pistol had gone off, is an assault in point of law, although, in fact, the pistol was not loaded.

But no *words*, however provoking or irritating, can amount to an assault. On the other hand, the injury need not be effected directly with the hand of the person making the assault. Thus, there may be an assault by encouraging a dog to bite, by riding over a person with a horse, or by wilfully and violently driving a cart, etc., against the carriage of another person. Nor is it necessary that the assault should be immediate; as where a defendant threw a lighted squib into a market-place, which, being tossed from hand to hand by different persons, at last hit the plaintiff in the face, and put out his eye, it was adjudged that this was actionable. And the same has been held where a person wantonly pushed a drunken man against another, and thereby hurt him. A defendant put some cantharides into coffee, in order that a woman might take it; and she did take it, and was made ill by it; and this was held to be an assault. It is also an assault, wilfully and of malice to expose another to the inclemency of the weather; so is the taking indecent liberties with females without their consent, although they did not actually resist; and to such indecent liberties a very wide application has been given, even to the extent of holding a medical practitioner guilty of assault, who stripped a young girl of her clothes, on the pretense that he could not otherwise judge of her illness. Not only does the

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striking that takes place at a *prize-fight* constitute an assault as between the combatants themselves, but all persons present in consent and co-operation may be punished as aiders and abettors. Again, an assault may be committed by unlawfully imprisoning or detaining the person of another; and by such detention is meant every confinement of the person, whether it be in a common prison or in a private house, or by a forcible detaining in the public streets. Numerous other cases could be stated, showing how nicely and protectively the law on this subject has been elucidated; but the explanation we have given is sufficient for its popular illustration.

Generally, it may be laid down, that the essential thing is the *intention* with which the alleged act is done, so that no matter how violent or menacing the conduct of the accused may have appeared to be, nor even how serious the injury, if it can be shown that the whole was unintentional or accidental and undesigned, there is no assault.

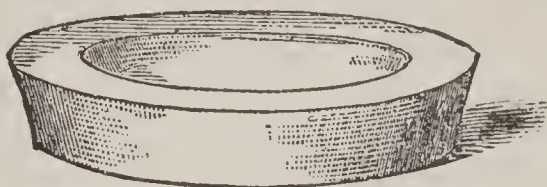
It is a good defense to prove that the alleged battery happened by accident, or that it was not in anger, or that it was merely the correction which a parent or master is entitled to use to a child, or scholar, or servant, or that it was done in self-defense, or in defense of a wife, a husband, a parent, a child, a master, or a servant; or that it was such personal force as a proper officer was entitled to employ.

With respect to *aggravated* assaults, their special character arises from the great criminality of the object intended to be effected. Thus, attempts to murder, or to do great bodily harm, to ravish, and to obstruct officers of the law in the execution of legal process, are all of the nature of aggravated assaults; as are also attempts to commit robbery, or any other felony. The success of the attempt is not a feature of the case; such an attempt involving violence constitutes an aggravated assault.

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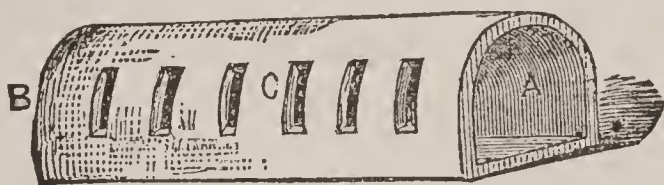
ASSAY, v. *ās-sā'* [F. *essayer*, to try: *essai*, a trial—from mid. L. *exāgĭum*: Gr. *exāgĭon*, a weighing, a trial]: to prove by examination; to try or prove, as metals; to attempt; to endeavor: N. examination; trial, as of the purity of silver or gold; tested value. **ASSAY'ING**, imp. **ASSAYED**, pp. *ās-sād'*. **ASSAY'ER**, n. one who.

ASSAY, or **ASSAYING**: process employed in determining the proportion of pure metal in a metallic ore or in an alloy. This method of analysis is more generally followed in the examination of compounds of silver and gold, but is resorted to likewise in the investigation of ores of iron, copper, tin, zinc, bismuth, antimony, mercury, and lead. In manufactured articles, also, such as silver-plate, and gold-plate, some foreign metal (usually copper) is present, to impart hardness to the metal; and in Great Britain, each article is assayed at the Goldsmiths' Hall, previously to being sold, so as to determine the exact richness of the metal whereof it is made. In the A. of compounds containing silver, the apparatus employed is a *cupel*—a small



Cupel.

basin-shaped vessel of the form and size of the figure, made of bone-ash; and a *muffle*, composed of fire-clay, about eight inches in length and three to four inches in diameter, shaped like a miniature railway tunnel, open at



Muffle.

the one end, A, closed at the other end, B, and having numerous slits or air-holes, C, along the side. The more simple A. of silver consists in the examination of argentiferous lead ore. By a preliminary process, the sulphur is separated (see **LEAD**); and weighed fragments of the mixed lead and silver being placed on cupels, the latter are introduced into the muffle, which has been previously heated in a furnace, where it still remains. The fire is then increased, and air being admitted to the muffle, the oxygen of the air unites with the lead, forming oxide of lead (PbO), which in part volatilizes through the openings in the side of the muffle, and in other part sinks into the porous bone-earth of which the cupel is made. While the lead is thus carried away, the silver remains behind as a molten metallic globule, and when the last traces of lead-fumes leave the silver bead, the latter suddenly *lightens*, and immediately thereafter becomes brilliant and

ASSAY.

white. On being slowly allowed to cool, the globule of silver may be weighed, and the amount of pure metal thus determined. The use of the cupel during this process has led to the term *cupellation* being employed in place of A. When silver contains copper, which it does in ordinary coinage and silver-plate, it becomes necessary to mix lead with the alloy before attempting to separate the copper. The manner in which the lead is generally added is to roll the alloy of silver and copper in a piece of sheet-lead or lead-foil, and place the whole package on the cupel. During the heating in the muffle, the lead oxidizes as usual, and in part passing into the bone-earth of the cupel, carries the copper with it. The amount of lead required to effect the separation of copper from silver in this way is given in the following table:

Standard of Silver in One Part.	Amount of Copper Alloy in One Part.	Quantity of Lead necessary for One Part of Alloy.	Quantity of Lead in relation to that of Copper.
1,000	0	$\frac{3}{10}$	part.
950	50	3	parts. 60 to 1
900	100	7	" 70 " 1
800	200	10	" 50 " 1
700	300	12	" 40 " 1
600	400	14	" 35 " 1
500	500	16 to 17	" 32 " 1
400	600	16 " 17	" 27 " 1
300	700	16 " 17	" 23 " 1
200	800	16 " 17	" 20 " 1
100	900	16 " 17	" 18 " 1
Pure copper.	1,000	16 " 17	" 16 " 1

The metallurgic chemist, while performing an A., can determine, by the examination of the stains on the cupel after the process has been finished, what metal may have accompanied, and been separated from, the silver, even in minute quantity. Thus, lead alone imparts a straw-yellow or orange stain; copper a gray or dark-brown tint; and iron, a black stain.

During the A. of silver by the foregoing or *dry* method, a certain loss of metal usually occurs, which averages 2 parts in 1,000; and this has induced the authorities in the mints of Great Britain, France, and other European kingdoms, and of the United States, to adopt a *humid* process for the A. of silver, which will determine the value of a silver alloy to within 0.5 (or half a part) in 1,000. The humid or wet A. consists in dissolving the compound of silver in nitric acid of density 1.25, and thereafter adding a solution of common salt (chloride of sodium, NaCl), which causes the precipitation of the chloride of silver (AgCl) in white flocculi. The common salt is made of a definite strength, and is poured out of a measured or graduated vessel, till all further precipitation of the silver ceases, when the amount required of the solution of common salt is read off, and by a simple calculation its equivalent in pure silver is obtained.

The A. of gold ores is conducted in a manner similar to that of silver. When the ore contains gold, lead, and cop-

ASSAY.

per only, it suffices to mix more lead with it, and heat in the cupel in the muffle furnace, when the lead and copper sink into the cupel, and the gold forms a globule on the upper surface. The proportion of lead required is regulated by the amount of copper present in the alloy.

Proportion of Gold contained in One Part of the Alloy.	Quantity of Lead necessary to completely remove the Copper by Cupellation.
1,000 thousands	1 part.
900 “	10 parts.
800 “	16 “
700 “	22 “
600 “	24 “
500 “	26 “
400 “ and under.	34 “

When the gold is accompanied by silver as well as copper, iron, and lead, it is necessary in the first place to subject the alloy to the A. process in the ordinary way, which rids it of the copper, iron, and lead, but leaves the silver still incorporated with the gold. The weight of this residual button gives the combined weights of the silver and gold present in the alloy. The method of separating the silver from the gold is called *parting*, and consists essentially in acting on the alloy with hot nitric acid, which dissolves away the silver, forming the soluble nitrate of silver, AgNO_3 , and leaves the gold undissolved. When the silver is present in small proportion, the gold assumes a protective influence, and keeps the nitric acid from acting on the silver; and to effect this separation satisfactorily, it is necessary that there should be about three parts of silver to one of gold. As that proportion does not occur naturally, or in any kind of manufactured gold-plate, it is requisite to incorporate some silver with it. This is generally accomplished by taking the proper quantities of gold and silver, wrapping them up in a piece of lead-foil, and heating on a cupel. The lead, during its disappearance from the heating vessel, causes the most intimate amalgamation of the silver and gold, which are left on the cupel as a metallic button. The latter, on being allowed to cool, is beaten out on an anvil with a smooth hammer, and is then passed through steel rollers, which yield a ribbon of alloy about the thickness of an enamelled address-card. The ribbon of metal being coiled up, is technically called a *cornet*, and when introduced into the flask with nitric acid, the entire solution of the silver is accomplished, while the gold is left as a brown-colored spongy mass, of the shape and size of the cornet. To give the metal the appearance and compactness of ordinary gold, the very friable metallic ribbon is gently transferred from the *parting glass* to a crucible by inverting the former into the latter; and the liquid which runs in with the gold being poured off, the crucible and its contents are raised to a red heat in a furnace, when the gold recovers its beautiful yellow color and metallic lustre, and at the same time becomes soft and flexible. The gold is now pure, and in a fit condition to be weighed, and the amount ob

ASSAYE—ASSEERGHUR.

tained indicates the proportion of pure gold in the original alloy. As the quantity of silver which is required to be present during this process, in order that the *parting* by nitric acid may readily take place, is three parts of silver to one of gold, it is customary to call this department of a gold A. *quartation*, or *inquartation*.

During the A. of silver or of gold, it is necessary to guard against any sudden increase or decrease in temperature. Independently of the probable loss of metal through the fracture of the cupels, it is found that when the final buttons of pure metal are obtained on the red-hot cupel, if great care be not taken to cool the whole very slowly, the bead of gold or silver *spits*, and little portions are thrown off. See ALLOY (in Chemistry): ALLOY (in Law): MINT (United States): also HALL (HALL-MARK): GOLD-SMITHS' COMPANY: PLATE-MARKS.

The mode of assaying gold above described often is not applicable for examination of jewelry and other manufactured articles, as removal of even a few grains might be the destruction of the article, and in such circumstances the *touchstone* is resorted to. This stone was originally brought from Lydia in Asia Minor, and consisted of a coarse-grained quartz saturated with bituminous matter, but black basalt and other stones are now employed for the same purpose. The manner of using the stone is to draw a streak upon it with the auriferous article; and from the color of the streak the richness of the gold can be very accurately determined by the practiced assayer. The subsequent action of nitric acid on the golden streak serves still further as a means of determining the purity of the metal, as the acid readily dissolves the copper and silver, and leaves the gold. See Mitchell's *Manual of Practical Assaying* (5th ed., by Crookes, 1881).

ASSAYE, *ás-sí'*: t. in the n.e. of the nizam's dominions, at the fork of the Juah and Kaitna; noticeable as the scene of the first great victory of the Duke of Wellington, then Maj.gen. Wellesley, 1803, Sep. 23. The British troops in action were only abt. 4,500, while the Mahrattas under Scindia and the rajah of Berar numbered 50,000, of whom 10,000 were commanded by French officers. Cannon numbering 98, 7 standards, all the baggage, and a large part of the ammunition of the Mahrattas fell into the hands of the conquerors, whose military supremacy was soon acknowledged over a great portion of India. In 1851, a medal was struck in commemoration of the victory.

ASSEERGHUR, *a'sēr-gŭr'*: fort on an isolated mountain at the n.e. angle of the presidency of Bombay, lat. 21° 26' n., long. 76° 26' e.; elevation above the base of the mountain, estimated 750 ft. Its extreme length and breadth are respectively 1,100 and 600 yds.; from the irregularity, however, of the outline, the area is computed at not more than 300,000 sq yds., or somewhat less than $\frac{1}{10}$ th of a sq. m. With the exception of two avenues of ascent, both of them difficult and strongly fortified, the space is everywhere terminated by a carefully scarped precipice, varying in height from 80 to 100 ft. This formidable fastness has been twice taken by the British—in 1803 and 1819.

ASSEGAI—ASSEMBLY, GENERAL.

ASSEGAI, n. *ās'sě-gā*, or ASSAGAY, or ASSAGAI, n. *ās'ā-gā* [Sp. *azagaya*, a spear or half-pike]: a dart or javelin used by the Kafirs, etc.: V. to pierce or kill with an assegai. AS'SEGAYING, imp. ASSEGAIED, pp. *ās'ě-gād*.

ASSEMBLE, v. *ās-sěm'bl* [F. *assembler*, to gather, to assemble—from mid. L. *assimulārē*, to bring together into one place—from L. *ad*, *simul*, together: AS. *samod*, together]: to gather a number of persons or things together; to meet together. ASSEM'BLING, imp. ASSEMBLED, pp. *ās-sěm'blđ*. ASSEM'BLER, n. *-blēr*, one who. ASSEMBLAGE, n. *ās-sěm'-blāj*, a mass of persons; a collection of particulars. ASSEMBLY, n. *ās-sěm'blī*, a number of persons met in the same place for a common object; a congregation; a convocation. GEN'ERAL ASSEM'BLY, the highest ecclesiastical court in the Established and Free churches of Scotland, and in the Presb. churches in Ireland and in the United States.—SYN. of 'assemble': to muster; collect; convene; convoke;—of 'assembly': assemblage; group; collection; company; meeting; congregation; parliament; diet; congress; convention; synod; convocation; council.

ASSEM'BLY [*assemblée*]: in the conduct of an army, the second beating of the drum before a march, at which the soldiers strike their tents if encamped, roll them up, and stand to arms.

ASSEM'BLY, GENERAL: in Scotland, Ireland, and the United States, denotes the highest court of the Presb. Church. It differs from the Anglican Convocation in its constitution and in its powers, representing as it does both the lay and the clerical elements in the church, and possessing supreme legislative and judicial authority in all matters purely ecclesiastical. The General A. of the Established Church of Scotland consists of representatives, clerical and lay, from all the presbyteries of the church. The royal burghs of Scotland also return elders to the General A. of the Established Church, and each of the Scottish universities sends a representative. The Assembly meets once a year, in the middle of May, at Edinburgh, and sits for ten days. Its deliberations are presided over by a moderator, whose election is the first step in the proceedings, after a sermon by his predecessor. In former times this office was filled sometimes by laymen: among others, in 1567, by George Buchanan. In modern times, the moderator is always a clergyman. Eighty-four presbyteries, composing 16 synods, return members to the General A. of the Established Church of Scotland. Its relation to the state is represented by a royal commissioner, who exercises no function in the A. beyond that of adding by his presence the sanction of the civil authority to its proceedings. The other functionaries are a principal and a deputy clerk, both clergymen, a procurator, and an agent. All business not despatched during the session of the A. is referred to a commission, with the moderator as convener, which meets immediately after the dissolution of the A., and again quarterly. The General Assembly of the Free Church of Scotland, which has 16 synods comprising 73 presbyteries, and the General

ASSEMBLY, NATIONAL.

Assembly of the Irish Presb. Church, are similarly constituted, the principal difference being the absence of the royal commissioner. In the United States, the General Assemblies of the Presb. Church, of the Presb. Church South (a secession from the former), of the Cumberland Presb. Church, and of the United Presb. Church, are constituted on the same general model with some differences in detail. The General Assembly of the Presb. Church in the United States has now become a very large body, as it is formed of delegates from the presbyteries in the proportion of one delegate to every 24 members of those bodies. See PRESBYTERY: SYNOD: BARRIER ACT: etc.

ASSEMBLY, NATIONAL (France): title assumed by the commons of the states-general (q.v.), convoked by Louis XVI. of France, and opened 1789, May 5. The states-general consisted of two privileged orders, clergy and nobles, and of the *tiers-état* or commons. The privileged orders refused to join the third estate and deliberate in a common chamber, and the latter, of its own authority, June 17, assumed the title of *Assemblée Nationale*, and the right to act in the name of France. The court attempted to annul this resolution in a royal sitting, June 23; but the deputies of the third estate, along with the liberal members of the other two orders, had bound themselves by oath not to separate until they had given France a constitution, and had declared every attempt at violence on the part of the court, treason. They refused to quit the common hall, and the court yielded, and commanded the nobles and clergy to join the National A. This was the beginning of the revolution, and the A. proceeded with astounding rapidity to metamorphose old France. The abolition of all privileges, Aug. 4, was followed by abolition of hereditary jurisdiction, and of restraints on religion and the press, and by the declaration of the Rights of Man (q.v.). In 1790, Feb., the monastic orders were suppressed, and all remnants of feudalism swept away; in March, *lettres de cachet* and the oppressive salt-tax were abolished; in June, all orders and titles of nobility. In July, non-Catholics had the property confiscated from their ancestors restored; Jews were relieved from personal taxation; and game-laws done away. A decree of Oct. 18 abolished the cruel criminal penalties of Louis XIV. In 1791, Jan., all corporations and guilds were abolished, and free-trade introduced. In Feb., political rights were conceded to Quakers; in May, the customs at city gates were abolished; in June, the torture; the violation of the secrecy of letters was also declared criminal. In Sep., all citizens, of whatever color or religion, received political rights.

The principles on which the Assembly proceeded were the sovereignty of the people, the independence of the communes, the limitation of the royal power through a conditional veto (q.v.), the separation of the political authorities, and the responsibility of ministers. Accordingly, the A., shortly after it was constituted, declared that to it alone, subject to the royal veto, belonged the legislative power. Several decrees, 1789, Sep., determined that the legislative body should form only one chamber, and should be renewed

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every two years; other decrees declared the king inviolable, and the throne inalienable. A decree of Nov. 7 forbade the deputies to undertake the place of ministers; in Dec., the new organization of the communes was begun. In 1790, Jan., France was divided into departments; in April, trial by jury was introduced; in May, it was declared that the right of war and peace belonged to the nation alone, that is, to the A.

In regard to finance, which had been the immediate cause of the Assembly's being convoked, the reforms were equally thorough. It was decreed at the outset that taxes were to be apportioned and raised without regard to rank or person. Then followed the approval of a loan of 80 millions of francs. A decree of 1789, Nov., ordered the publication of the public accounts; another in Dec. established a national bank. In 1790, March, appeared the first law sanctioning the sale of 400 million francs' worth of the national domains; and in April, another ordering the issue of *assignats* (q.v.) on the national property; in Oct., these assignats were declared to bear no interest. These measures were followed, in the beginning of 1791, by a series of laws regarding coining, taxation, encouragement to industry, revenue management, etc. A committee of the A. appointed to reform church matters, made a complete overturn of the old ecclesiastical system. After a declaration that Roman Catholicism had ceased to be the state religion, tithes were abolished, and church property confiscated. Church ornaments and valuables were appropriated as patriotic gifts to the state; the civil jurisdiction of the bishops was taken away, and monks and nuns were freed from their vows. The clergy was put under a civil constitution. Each department was a see, and the communes ruled and paid bishop and curés. All the clergy were amenable to the civil courts, without appeal to the pope or the interference of any ecclesiastical authority whatever. Every clergyman had to take an oath accepting this constitution, which led to the emigration of a number, and subsequently to enactments of excessive rigor against refractory priests (*prêtres insermentés*).

The A. having thus laid the revolution on a foundation of 3,250 decrees, and having sworn to the new constitution, and secured its acceptance by the king, closed its sittings, 1791, Sep. 30. From its having framed the constitution (which lasted only 12 months), this assembly is usually called the Constituent A. It made way for the LEGISLATIVE ASSEMBLY, which was to reform the civil and criminal laws in accordance with the spirit of the new constitution. A decree had provided that no member of the Constituent should be returned to the Legislative A. But the democratic party received such preponderance at the elections, that the A. forgot its mission from the very first, and commenced a war with the remnants of the royal authority, which ended, 1792, Aug. 10, with the overthrow of the throne and the suspension of the king. The constitution had provided for an appeal to the nation in extreme cases, and the Legislative A. now exercised that right by con-

ASSEMBLY OF DIVINES.

voking a *National Convention* (q.v.), which, being invested with the powers of the sovereign, was to decide on the fate of the monarchy, and remodel the whole political system.

The title of National A. has been assumed by various other parliamentary bodies, originating in popular commotions, and aiming at radical political changes; as the French A. that met after the revolution of 1848, Feb., which was followed 1849, Apr., by a Legislative A.; the German National A. at Frankfort; and the Prussian National A. Under the existing French republic, the senate and the chamber of deputies united form the National A.

ASSEMBLY OF DIVINES', or WESTMINSTER ASSEMBLY: a convocation appointed by the Long Parliament for settling the doctrine, liturgy, and government of the Church of England. It consisted of 120 clergymen and 30 laymen—10 of whom were lords and 20 commoners—together with 4 clerical and 2 lay commissioners from the Church of Scotland. Among the more distinguished of the divines were Usher, Saunderson, Reynolds, Brownrigg, Ward, Twisse, Lightfoot, Gataker, Burges, Goodwin, Calamy, and Nye; of the laymen, Selden, Prideaux, the two Vanes, Rouse, Pym, Whitelocke, St. John, and Maynard. The Scottish divines were Henderson, Gillespie, Rutherford, and Baillie. Twenty-five of those whose names were contained in the ordinance calling the Assembly, dated 1643, June 12, never appeared at the discussions, one or two of them having died about the time of the first meeting, and the others fearing the displeasure of the king. To supply the place of these absentees, some additional members, called the superadded divines, were summoned to attend. The A. held its first meeting 1643, July 1, and continued to sit till 1649, Feb. 22, during which time it had met 1,163 times. Its most important work was concluded long before that time. One of the first things it did was to give its sanction to the *Solemn League and Covenant*, against which Dr. Burges alone stood out for several days. The Presbyterians formed a large majority in the Assembly, and exercised a corresponding influence on its decisions. In doctrine, the members were almost unanimous; but on the subject of church government, opinions extremely opposite were maintained with keenness, especially on the question touching the sphere and limits of the civil power in matters ecclesiastical. The principal fruits of its deliberations were the *Directory of Public Worship*, submitted to parliament 1644, Apr. 20; the *Confession of Faith*, 1646, Oct. and Nov.; the *Shorter Catechism*, 1647, Nov. 5; and the *Larger Catechism* 1648, Sep. 15. These several formularies, which contain a clear and rigid embodiment of Calvinistic theology and Presbyterian church government, constitute to this day the authorized standards of the Presbyterian churches of Scotland, Ireland, England, and the United States. The *Directory of Public Worship* was ratified by both houses of parliament, 1644, Oct. 2, and the doctrinal part of the *Confession of Faith* 1648, March. An order of the house of commons, 1647, Oct. 13. ordained that the Presbyterian

ASSENT—ASSERT.

form of church government should be tried for a year, but no further legislation followed. What has hitherto been known as to the details of the proceedings of this convocation has been derived chiefly from the *Letters* of Baillie, and Lightfoot's *Journal*.—See Hetherington's *History of the Westminster Assembly* (1843); and the 2d vol. of Masson's *Life of Milton*, published in 1871 (pp. 509–527), where a list of the members, with brief biographic notices, is given. See CREEDS AND CONFESSIONS.

ASSENT, v. *ās-sěnt'* [OF. *assentir*, to assent, to consent—from L. *assentiō*, I assent—from *ad*, to; *sentīō*, I think]: to think in accordance with some one; to admit as true; to yield; to agree: N. act of admitting or agreeing to; consent. **ASSENT'ING**, imp. **ASSENT'ED**, pp. **ASSENT'ER**, one who. **ASSENTATION**, n. *ās-sěn-tā'shŭn*, hypocritical assent to everything which another says; pretended concurrence in every opinion, however absurd, which he broaches. **ASSENTIENT**, a. *ās-sěn'shĭ-ěnt*, assenting to, as opposed to *dissentient*. **ASSENT'IVE**, a. *-ĭv*, assenting. **ASSENT'INGLY**, ad. *-lĭ*.—**SYN.** of 'assent, v.': to accede; yield; acquiesce; consent; accord; agree; concur; coincide; comply; conform; submit; concede; approve.

ASSENT' RO'YAL: see PARLIAMENT.

ASSER, n. *ās'sěr* [L. *asser*, a small beam or lath]: in *arch.*, a thin rafter, board, or lath.

ASSER, *ās'sěr*, **JOHN**: d. 910: biographer of Alfred the Great. The *Saxon Chronicle* records some events of his career. He was a monk of St. Davids, from the Latin name of which, *Menevia*, he is termed in the old records *Asserius Menevensis*. About 885, his reputation for learning and piety procured him an invitation to the court of Alfred, where he resided at intervals during the rest of the king's life, assisting him in his studies, and receiving his affectionate confidence, of which he seems to have been every way worthy. The king promoted him to various dignities, and finally made him Bishop of Sherborne. Several works have, with more or less authority, been attributed to A. The only one undoubtedly his is *Annales Rerum Gestarum Aelfredi Magni*. This simple and most interesting narrative was first pub. 1574 by Abp. Parker. Its trustworthiness was questioned (1842) by Thomas Wright, in the article 'Asser' of his *Biographia Britannica Litteraria*. Lingard and Dr. Pauli have replied; and the prevailing impression of scholars in Anglo-Saxon literature is that there is no reason for doubting its general accuracy. The best ed. is that of Wise (Oxf. 8vo. 1722).

ASSERT, v. *ās-sért'* [OF. *asserteur*, to assert: L. *assertus*, bound or fastened to one's-self—*lit.*, to join or fasten to]: to affirm positively; to maintain. **ASSERT'ING**, imp. **ASSERT'ED**, pp. **ASSERTION**, n. *ās-sér'shŭn* [F. *assertion*—from L. *assertiōnem*]: the act of asserting; an affirmation. **ASSERTIVE**, a. *ās sér'tĭv*, that affirms positively. **ASSER'TIVELY**, ad. *-lĭ*. **ASSERT'ORY**, a. involving an assertion; designed to support an assertion. **ASSERT'OR**, n. one who.

ASSES—ASSETS.

—SYN. of 'assert': to affirm; asseverate; aver; protest; maintain; pronounce; declare; vindicate.

ASSES, FEAST OF: see FOOLS, FEAST OF.

ASSESS, v. *ās-sēs'* [OF. *assesser*, to assess—from L. *assessus*, sat down—from *ad*, to; *sessus*, sat or remained, set]: to set or fix a rate to be paid; to value; to rate. ASSES'SING, imp. ASSESSED, pp. *ās-sēs't'*. ASSES'SABLE, a. *-sā-bl*, that may or ought to be assessed. ASSES'SABLY, ad. *-bli*. ASSES'SMENT, n. the amount of a tax laid on a property. See TAX—TAXATION. ASSES'SOR, n. *-sēr* [F. *assesseur*, an assessor—from L. *assessōrem*]: one who sits by a judge or an arbiter as a legal adviser or as a helper: in OE., one next in dignity; one authorized to fix the value of taxes. ASSESSORIAL, a. *ās'sēs-sō'rī-āl*, or ASSESSIONARY, a. *ās-sēs'h'ōn-ēr'ī*, pertaining to an assessor.

ASSESSION, n. *ās-sēs'shūn* [L. *assessio*—from *ad*, to; *sessio*, a sitting]: a sitting near one to give one counsel. ASSES'SIONARY, a. pertaining to assession.

ASSETS, n. plu. *ās'sēs'ts*, or ASSET, n. sing. *ās'sēt* [OE. *asseth*: Scot. *assyth*, compensation, satisfaction: L. *ad*, for; *satis*, enough: F. *assez*, enough: Ger. *satt*, satisfied—*lit.*, up to what is enough]: funds or property available for payment of debts, etc. In strictness the term is not applicable to the property of a person who dies intestate, and without any debts to be paid. In general acceptance, however, it is understood to mean the property left for distribution by a deceased person, whether testate or intestate; and in commerce, and also in bankruptcy and insolvency, the term is used to designate the stock in trade and entire property of all sorts belonging to a merchant or to a trading association.

A. are either *personal* or *real*, the former comprehending such goods, chattels, and debts as devolve on the executor; and the latter including all real estate, whether devised or descending to the heir at law. In connection with this distinction, A. are also said to be *A. by descent*, and *A. in hand*, the former of these being recoverable from the heir to whom the land descends, and so far as such lands will extend—the latter signifying such property as a person leaves to his executors sufficient for the clearing of burdens and bequests affecting his personal estate. A. are also in their nature either *legal* or *equitable*, according to the nature of the remedy which may be used by creditors against the executor or heir. Where there are several creditors of equal degree, the executor is bound to pay him who first obtains judgment for his debt; and he cannot resist on the ground that nothing will be left for the other creditors. If, after exhausting the whole A. which have come to his hands, by the payment of debts in due order, he be afterwards sued by a creditor remaining unpaid, he is entitled to protect himself by an allegation that he has fully administered, or technically by a plea of *plene administravit*; and upon this plea the creditor is entitled to judgment that he shall be paid out of any other A. that

ASSEVERATE—ASSIGN.

shall come to the defendants, which is called a judgment of A. *in futuro*.

ASSEVERATE, v. *ās-sěv'ēr-āt* [L. *assēverātus*, stated earnestly—from *ad*, *sěvērus*, earnest, serious]: to assert with much earnestness; to declare positively; to affirm solemnly. ASSEV'ERA'TING, imp. ASSEV'ERA'TED, pp. ASSEVERA-TION, n. *ās-sěv'ēr-ā'shŭn*, a positive declaration; a solemn affirmation or assertion.—SYN. of 'assevérate': to affirm; protest; declare; aver; assert.

ASSIDE'ANS: see CHASIDIM.

ASSIDENT, a. *ās'sĭ-děnt* [L. *assiden'tem*, sitting by or near—from *ad*, to; *sedĕō*, I sit]: associating with or sitting by others—applied to symptoms or signs of a disease.

ASSIDUOUS, a. *ās sĭd'ŭ-ūs* [L. *assid'ŭŭs*, sitting closely—from *ad*, *sedĕō*, I sit: F. *assidu*, assiduous—*lit.*, sitting close or near]: very attentive; careful; diligent. ASSID'UOUSLY, ad. *-lĭ*. ASSID'UOUSNESS, n. the quality of being assiduous; close diligence. ASSIDUITY, n. *ās'sĭ-dŭ'ĭ-tĭ*, close application; great diligence.—SYN. of 'assiduous': diligent; active; industrious; laborious; sedulous; attentive; unwearied; indefatigable; persevering; unintermitted.

ASSIENTO, or ASIEN TO, n. *ās'ĭ-ĕn'tō* [Sp. *asiento*, a treaty, a contract]: a contract or convention; a special treaty: specially applied to a compact between Spain and some foreign nation, according to which the Spanish government conferred upon the latter, under certain conditions, the monopoly of the supply of negroes for its American colonies. It was Charles I. of Spain who first concluded an A. with the Flemings. Next, a similar compact was entered into with the Genoese (1580), the Portuguese (1696), and on the accession of Philip V. to the Spanish throne in 1702, with the French Guinea company, which from that time took the name of A. company, upon the understanding that for ten years it should have the exclusive right of annually importing 4,800 negroes of both sexes to the continent and islands of Spanish America. The A. was next transferred to England at the peace of Utrecht in 1713, and made over by government to the South Sea company for 30 years, permission being also granted to the company to send yearly, during the term of contract, a ship, carrying 500 tons of goods, to these Spanish colonies. The misunderstandings that grew out of this last clause contributed not a little to the war that broke out between the two nations in 1739. At the peace of Aix-la-Chapelle in 1748, the English company having still four years to run, their rights were guaranteed to them; but they relinquished them at the Madrid Convention of 1750, upon the payment of £100,000, and the concession of certain commercial advantages.

ASSIGN, v. *ās-sĭn'* [F. *assigner*, to assign—from L. *as-signāre*, to mark out something, to seal—from L. *ad*, to; *signo*, I mark out]: to mark out something for bestowal; to point out; to allot to; to transfer: N. a person to whom property is transferred. ASSIGN'ING, imp. ASSIGNED, pp.

ASSIGN—ASSIGNATS.

ās-sīnd': ADJ. that is fixed or allotted. ASSIGNER, n. *ās-sīn'ér*, one who. ASSIGNOR, n. *ās-sī-nawr'*, in *law*, one who assigns. ASSIGNABLE, a. *ās-sīn'ā-bl*, that may be transferred; that can be allotted or specified. ASSIGNATION, n. *ās'sīg-nā'shŭn* [F.—L.]: a making over to; an appointment to meet, as of lovers; a designation or marking out. ASSIGNEE, n. *ās'sī-nē'*, a person appointed to do something; one to whom an assignment is made. ASSIGNMENT, n. *ās-sīn'měnt*, the thing assigned; the transference of some right or interest.

ASSIGN, To, in Law: to transfer or grant over to a third party a security, a right of credit, or other right, whether in possession or in reversion, granted by a party indebted or under obligation to the party assigning. The words of assignment are to *A.*, *transfer*, and *set over*, and they operate to transfer both real and personal property. See ASSIGNMENT: ASSIGNATION: ASSIGNMENT OF ERROR: BANKRUPTCY.

ASSIGNA'TION: a legal term in Scotch conveyancing. analogous to the English word Assignment (q.v.); though assignment is in Scotland the technical term for the transference of certain property, such as copyrights, patents, and registered vessels.

ASSIGNATS, n. plu. *ās'ŷn-yās'* [F.—(see ASSIGN)]: paper money issued by the French government during the first revolution. After appropriating to national purposes the land belonging to the church, the French national assembly (see ASSEMBLY, NATIONAL), instead of bringing it into the market at a time of insecurity, when its value was depreciated, issued bonds on the security of it, which were called *assignats*, as representing land *assigned* to the holder. This paper money consisted chiefly of notes for 100 francs (abt. \$20) each, though many of them were for sums as low as ten or five francs, and even lower; and the first issue amounted to 400 million francs (abt. \$80,000,000). The first A., issued in the spring of 1790, bore interest; subsequent issues did not. The facility of this plan of providing government income led to its being repeatedly resorted to as the property of wealthy emigrants—persons who abandoned their country in alarm—fell into the hands of the rulers, and was confiscated, till the amount rose to the enormous sum of 45,578 million francs, besides a great number of forged A. manufactured abroad and smuggled into the kingdom. The value of the A. naturally soon began to decline, and confidence once gone, the declension became fearful. In 1793, June, one franc in silver was worth three francs in paper; in Aug., it was worth six. The state took extreme measures to compel the acceptance of A. at their full nominal value. The effects of these were to cause the A. to flow back into the public treasury, to raise the prices of all commodities, and to make every one averse to have any dealings with the state. One of these consequences was attempted to be met by fixing a maximum of prices. But no one could compel producers and dealers to produce and sell at a loss; so that all business be-

ASSIGNEE IN BANKRUPTCY—ASSIGNMENT

came disorganized. At last the value of A. came almost to nothing. Millions of individuals had suffered incalculable loss, and only a few who had bought public lands with the A. that cost them little or nothing, had enriched themselves at the expense of the community. In 1796, March, a louis d'or (24 francs) brought 7,200 francs in A. After this, they were withdrawn from the currency (1796) and redeemed at a thirtieth of their nominal value by *man-*



Fac-simile of Assignat.

*dat*s, a new kind of paper money, which enabled the holder at once to take possession of public lands at the estimated value, while A. could only be offered at a sale. The *mandats* also soon fell to a seventieth of their nominal value, and were returned to government in payment of taxes or of land.

At length, in 1796, July, the system of paper-credit, so obstinately persisted in by government, and so disastrous in its results to the public, came to an end. A law was passed, declaring that every one was entitled to transact business in whatever circulating medium he pleased; that the *mandats* should be taken at their current value; and that the taxes be received either in coin or in *mandats* at that rate. The A. were executed on a coarse kind of paper, and, as will be seen by the accompanying fac-simile, the devices were so meagre as to be easily counterfeited.

ASSIGNEE' IN BANKRUPTCY: see BANKRUPTCY.

ASSIGNMENT, in Law: a conveyance (usually in writing) by which one transfers to another, for a sufficient consideration, a right in expectancy, in reversion, or in possession. The common or popular meaning of this word is the

ASSIGNMENT OF ERROR—ASSINIBOIA.

transfer of any property, real, personal, and mixed, whether the same be in possession, or in action; the technical form being to assign, transfer, and set over; but the words grant, bargain, and sell, or any other words which will show the intent of the parties to make a complete transfer, will amount to an A. The deed by which an A. is made is also called an A. By an A. of a right all the accessories which belong to it pass with it; as, if the assignor of a bond had collateral security, or a lien on property, the collateral security and the lien will pass with the assignment of the bond. The assignment of anything carries with it all that belongs to it by right of accession; if, therefore, the thing produce interest or rent, the interest or the arrearages of the rent since the A. will belong to the assignee. There are exceptions to assignments; such as personal trusts, the duties of a guardian, the salary of a judge, the commission or pay of a public officer, the right of action for fraud, and rights *pendente lite*. The indorsement of negotiable bills effects their A. Ordinarily assignments are the resort of insolvent debtors for the protection of their creditors, and to obtain their discharge from further obligation, and such cases are regulated in the different states by special statutes. In the case of an A. of a policy of insurance, by consent of the underwriter, or by statute, the A. vests in the assignee all the rights of the assignor, exception being made where a condition to the contrary is expressed in the policy. By an A. of dower the share of a widow in her deceased husband's real-estate is set apart for her use by the heir or his guardian, or by whomsoever is in possession of the land subject to dower; or, if voluntary A. be refused, this may be enforced by direction of the court after legal proceedings.

ASSIGNMENT OF ERROR: see APPEAL: ERROR.

ASSIMILATE, v. *ās-sīm'ī-lāt* [L. *assimilātus*, assimilated—from L. *ad*, to; *similis*, like: F. *assimiler*, to assimilate]: to make like; to bring to a likeness; to change into its own substance. ASSIM'ILA'TING, imp. ASSIM'ILA'TED, pp. ASSIM'ILABLE, a. *-lā-bl*, that may be assimilated. ASSIMILATIVE, a. *ās-sīm'ī-lā'tiv*, or ASSIM'ILATOR'Y, a. *-tér'ī*, that can make into a like or similar substance. ASSIMILATION, n. *ās-sīm'ī lā-shŭn* [F.—L.]: the process by which plants and animals convert food into the various tissues of their own proper substance. See NUTRITION. ASSIMILABIL'ITY, capability of being assimilated. ASSIM'ILATENESS, quality of being similar to; likeness.

ASSINIBOIA, *ās-sīn-ī-boy'ā*: Canadian dist., formerly a part of the Northwest Territories, but formed by an order in council in 1882. It is w. of Manitoba; is bounded on the s. by the United States frontier, w. (at 111° w.) by Alberta territory, n. (at 52° n.) by the new territory of Saskatchewan; area 89,535 sq. m.; it is intersected by the Canadian Pacific railway, by the Q'appelle, South Saskatchewan, and Souris rivers; and contains the towns of Regina (new cap. of the n.w.), Fort Pelly, and Fort Ellice. A. in general resembles Alberta (q.v.). Pop. (1901) 67,385.

ASSINBOINÉ—ASSIZE.

ASSINIBOINE, *ās-sīn'v-boyn*; river of British N. America, rising in lat. 51° 46' n., and about long. 105° e. At Winnipeg it joins the Red river (q.v.), which discharges its waters into Lake Winnipeg. At a point 140 m. from its mouth, the A. is 230 ft. broad; its course measures about 400 miles. The river gives name to a tribe of Indians.

ASSISI, *ā-sē'sē* (*Assisium*): town of Central Italy; upon a steep hill, 13 m. s.e. of Perugia. It stands in a singularly picturesque situation, and is surrounded by a wall flanked with towers, and overhung by a lofty citadel in ruins. It is the birthplace of St. Francis, who here founded the Convento Sacro, the first monastery of the Mendicant order that bears his name, a large and beautiful structure, and one of the earliest specimens of the Gothic style of architecture in Italy. The church and the galleries of the monastery contain fine paintings by Cimabue, Giotto, and other old masters. Besides the Convento Sacro, there are eleven other monasteries in A. Of these, the largest is the Portiuncula, which has a richly decorated church, with a cupola by Vignola. In the last century, this place was a great resort of pilgrims, visiting the tomb of the saint, of whom one hundred thousand are said to have been assembled here on one day.

A. occupies the site of the ancient Assisium, a municipal town of Umbria, and presents the remains of the forum, the baths, and the aqueducts of the days of the Romans. In the piazza, or square, there stands a beautiful portico of the ancient temple of Minerva, consisting of fluted Corinthian columns and a pediment. There is abundance of olive-trees, and some fine mineral springs in the vicinity. The town has given title to a bishop since 240. It has manufactures of needles and files. Pop. 3,700.

ASSIST, v. *ās-sist'* [F. *assister*, to assist—from L. *assistere*, to stand by one—from *ad*, to; *sisto*, I am made to stand]: to stand by one as counsel before a tribunal; to help; to relieve; to aid; to succor. **ASSIST'ING**, imp. **ASSISTED**, pp. **ASSISTANCE**, n. *ās-sis'tāns* [F.]: help; succor; aid. **ASSIS'TANT**, or **ASSIS'TER**, a. helping; lending aid: N. one who helps or lends aid. — **SYN.** of 'assist': to help; aid; succor; relieve; second; back; support; favor; benefit; sustain; befriend; further.

ASSIZE, n. *ās-sīz'*, plu. **ASSIZES**, *ās-sī'zēz* [OF. *assise*, a set rate, a tax, an assembly of judges: It. *assisa*, settled pattern of dress: L. *assessio*, a sitting—from *ad*, to; *sessus*, sat]: a session or sitting as of a court of justice; the set day on which a court is to be held; in *plu.*, a court of justice in England held two or three times a year in a county or circuit; *sing.*, in *OE.*, a statute regulating the measure and price of commodities. **ASSIZE**, v. to fix measures or rates; to settle. **ASSIZ'ING**, imp. **ASSIZED**, pp. *ās-sīz'd'*. **ASSI'ZER**, n. *-zēr*, one who. **ASSIZE OF BREAD**, in *OE.*, the settled rate for the sale of bread.

ASSIZE: a word literally signifying a 'sitting' or 'session': used in the principal European legal systems, and

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very much in the same sense, or rather senses, in all, for it has more than one distinctive meaning. As is common with regard to most of the ancient British legal technicality, the Latin language, in the first instance (*assideo*), and then the French (*assis*), appear to have led to its introduction into the phraseology of the law of England and Scotland. In England the word may signify a jury (as in Scotland), and it is sometimes used to denote an ordinance, decree, or law. But in modern practice, it is commonly applied to the sessions or sittings of the judges of the superior law-courts, held periodically in each county, for administering civil and criminal justice. These courts came into use instead of ancient justices in eyre, *justicia rei in itinere*. They are now appointed by commissions issued twice a year to the judges of the high court of justice, two judges being generally assigned to each circuit. The circuits are, since 1875, seven in number—Northern, North-eastern, Midland, Southeastern, Oxford, Western, and North and South Wales; and in going them, the judges or commissioners sit by virtue of four several authorities: 1. The commission of the *peace*; 2. A commission of *oyer and terminer*; 3. A commission of general *jail delivery*. The other authority is, 4. That of *nisi prius*, which is a consequence of the ancient commission of A. being annexed to the office of justices of A. by the statute of Westminster the second. The circuit system does not extend to London and Middlesex, which have instead courts of *nisi prius*, which are held before the chief or other judge of the superior courts for the trial of civil causes, at what are called the London and Westminster sittings; these districts have also the central criminal court, with its enlarged jurisdiction.

The circuit courts of Justiciary in Scotland, of which there are three—the north, the west, and the south—resemble the assizes in England; but in civil causes their authority is very limited.

In the sense of an ordinance or law, the term A. has various applications, although chiefly in the more ancient systems of jurisprudence. Thus, the ‘Assizes’ of Jerusalem were, according to Gibbon’s *Decline and Fall* (vol. xi. p. 93), a code of feudal laws for the kingdom of Jerusalem, formed 1099 by an assembly of the Latin barons and of the clergy and laity under Godfrey of Bouillon. There were also the ‘Assizes’ or ordinances regulating the price of bread, ale, fuel, and other common necessities of life, all of which ordinances have been abolished. See COURTS: JUDGE: JUDICIARY: JURY TRIAL: FAIRS.

ASSOCIATE, v. *ās-sō’shī-āt* [L. *associātus*, associated, united—from L. *ad*, to; *sociō*, I join; *socius*, a companion: F. *associer*]: to make one person a companion to another; to join in company as a friend or companion: N. a companion; a partner. ASSO’CIA’TING, imp. ASSO’CIA’TED, pp. ASSOCIATION, n. *ās-sō’shī ā’shūn* [F.—L.]: the union of persons in a company, usually for mutual benefit; a society; connection, applied to ideas. ASSO’CIA’TIVE, a. *-tīv*, having the quality of association. ASSO’CIA’TOR, n. one who.

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ASSO'CIABLE, a. -ă-bl, companionable. ASSO'CIABLENESS, n., or ASSO'CIABIL'ITY, n. -bîl'î-tî, the quality of being companionable. ASSO'CIATESHIP, n. the state or office of an associate. ASSO'CIA'TIONAL, a. -shî-ă'shûn-ăl, pertaining to. ASSOCIATION OF IDEAS, the process by which one idea when excited presents to the mind contiguous or similar ideas.—SYN. of 'associate, n.': companion; comrade; colleague; mate; partner; fellow; friend; ally; coadjutor;—of 'association': partnership; alliance; combination; society; company.

ASSOCIATED PRESS: a combination of newspapers for the collection and distribution of news for all journals identified with it. The pioneer in this field in the U. S. was J. W. Webb, who, 1829, founded the *Courier and Enquirer* in New York, and began to collect news from out-of-city parts, which he sold to his rivals. The first organization of newspapers was made in New York 1849, and named the Associated Press. It included such papers as the *Herald*, *Tribune*, *World*, *Mail and Express*, etc. The Western Associated Press was founded in Chicago, 1865, and the United Press Association in New York, 1882. A bitter competition arose between these three associations, which was greatly intensified by the organization of numerous smaller associations which took sides with one or the other of the three larger ones. Many compromises were arranged, but no adjustment was effected till 1892, when the United Press absorbed the Associated Press. In 1894 the United Press Local News Association was started in New York. Gradually the smaller associations were either forced out of business or absorbed. Thus, after a series of combinations, the Associated Press came once more into power, and practically monopolized the whole industry in the United States. The Associated Press has agents scattered all over the world, who send local news to their nearest headquarters, whence it is forwarded to the main office in New York. It is then distributed to the various members of the association. The country press and non-member newspapers are given the facilities of the Associated Press by purchasing the news at a price fixed in accordance with the amount of news taken daily or weekly.

ASSOCIATE PRESBYTERIAN CHURCH, in the United States: see UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA: PRESBYTERIAN CHURCH IN THE UNITED STATES.

ASSOCIATE REFORMED PRESBYTERIAN CHURCH: see UNITED PRESBYTERIAN CHURCH OF NORTH AMERICA.

ASSOCIATE SYNOD—ASSOCIATE PRESBYTERY, etc.: designations adopted among the dissenters from the Church of Scotland. See SCOTLAND, CHURCH OF UNITED PRESBYTERIAN CHURCH. In the United States also there are an Associate Synod and an Associate Reformed Church, offspring of the Scottish Secession.

ASSOCIA'TION: see CO-OPERATION: LEAGUE: COMPANY: SOCIETIES.

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ASSOCIATION OF IDEAS: the process by which an idea calls up, or is called up by, other ideas. This is an important department in the Philosophy of the Human Mind, as it relates to a pervading fact at the foundation of our intelligence. An exposition of this subject supplies an exposition of a number of the complex phenomena of mind more satisfactory than if those phenomena were treated separately. What is meant by A. is familiarly illustrated by such occurrences as the following: When we see the sky becoming overcast, we think of rain as about to follow, the notion of rain not having previously been present to our mind. When we hear the church-bells, we are apt to think of the throngs in the street, or of some of the other circumstances of public worship. When we pass a house, we are reminded of its occupant; and meeting a person we know, we may be carried in thought to his office, and from that to other persons holding the same office, and so on. If an object is before a person's eyes, as a mountain, he is said to receive an impression or sensation of it, in consequence of the actual presence of the thing; but it is possible for him to remember the mountain, or to have an idea of it, when far away from the reality, in which case there must be some power in the mind itself, different from the susceptibility to objects present, a power of retaining, reviving, or resuscitating those states at first induced by contact with the actual. Besides the sights, and sounds, and touches caused by contact with real things, we are greatly occupied with sights, sounds, and touches remembered, anticipated, or imagined, which is to live in a world of ideas; and it is in this world that the process termed Association has its sphere. When an idea is brought before the mind without its original, as when one pictures to his mind the late Duke of Wellington, the circumstance is owing to the mention of his name, or of some incident connected with him; and the remembrance of his personal appearance, as he may have been seen when alive, is said to be the result of an association existing in my mind between two ideas, so that the one is able to recall or restore the other. The association between names and things comprehends one of the most extensive applications of the power in question.

The circumstances under which one idea brings forward another into the view are principally these two—viz., first, previous *proximity*; and second, *likeness*. The terms 'Contiguity' and 'Similarity' are used in Mental Philosophy to express them. The first is exemplified in the examples of association given above; for in most of those it will be found that the conjoined notions have been frequently in the view at the same time, in consequence of which they have, as it were, grown together, or become part of the same whole. Thus, we have often noticed the darkened sky followed by a shower: the two facts have occupied the attention simultaneously, and in virtue of some power belonging to our mental framework, they have cohered into an inseparable couple or aggregate in the mind. This is proximity, or contiguity. When one

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idea suggests another which was never in company with it before, it is generally through the force of some *likeness* between the two. I meet an old man in the street with a very peculiar face, which reminds me of the bust of Socrates. These two things had never accompanied one another in my mind before, and therefore it could not be the force of proximity that made the second to arise at the instigation of the first; but there was a certain amount of likeness or similarity between the old man's features and the features of Socrates, as represented in the bust; and it is a fact of man's mental constitution, no less certain and no less important than the foregoing, that in cases where something now before the mind has a strong cast of resemblance to something formerly observed or conceived, but not at present thought of in any way, the present is apt to recall that past idea, whatever it may be. By the force of likeness, the traveller in new countries is constantly reminded of the scenes and objects familiar to him, and so is induced to draw comparisons between the one and the other. Identification and comparison both imply that things are brought together by virtue of their similarity, they not having been in company before. The principle of proximity operates most in Memory, Habit, and Routine; similarity has to do with invention and originality, and is essential to the processes of Reason and Imagination.

Law of Contiguity.—The principle of association by proximity is not confined to ideas. We must state it in a more comprehensive form, in order to comprise the full sphere of its application; for our mechanical habits are formed through the very same power of our constitution that enables us to recall or remember ideas. The taught movements of a soldier or of a skilled workman are connected together so firmly that one succeeds to another almost of its own accord. Everything of the nature of acquisition supposes a plastic property in the human system, giving permanent coherence to acts that have been performed together.

The following is a general statement of the law under consideration:

Actions, Sensations, States of Feeling, and Ideas, occurring together, or in close succession, tend to grow together, or cohere in such a way that when any one of them is afterwards presented to the mind, the others are apt to arise.

And first, as to association of Actions, or voluntary movements. When we perform a train of movements without any further aid of the will than to commence the series, there must be a fixed connection between each and the one that follows, and this connection may be either instinctive or acquired. There are various cases of instinctive trains, such as the action of the heart, lungs, and intestines, and the movements of deglutition. When a morsel of food reaches the back part of the mouth, the muscles of the throat seize hold of it, and transmit it to the stomach, independent of our will. The connected movements in this case are provided for in the original structure of the nervous and muscular system. In walking there is partly

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an instinctive tendency to alternate the limbs, and partly a confirming acquisition, the result of practice. But in those complicated operations that human beings are taught to execute in the various avocations of life, the associating principle is everything. The apparently simple and easy act of taking food is a complicated acquisition; in other words, an extensive group of associated movements. The seizing of the morsel is followed by the movement of the arm that carries it to the mouth; the mouth is opened simultaneously; after which follow the processes of biting and chewing; all which take place with the certainty of a machine, and without effort or attention directed to them. These associations were originally built up by slow degrees. 'As a general rule, it takes many repetitions to cement so firm a union between successive and simultaneous movements as is implied in the above instance.'

A good example of the association of movements is furnished in our acquirement of spoken language, as in committing to memory words, sayings, and passages of books. When a child has perfectly acquired the Lord's Prayer, the chain of association is so firmly knit, that the articulation of the words 'Our Father' is followed almost irresistibly with those next succeeding, and so on to the end. The cohesion in this case is between the vocal movements corresponding to the enunciation of the words. Having gone many times through this one definite succession, the stream of nervous power, in some way that we cannot at present explain, acquires a tendency to fall into this one definite track, and in future to bring on the movements in the exact order that they have so frequently followed.

It is not merely actual movements that can be joined together in this way, but the *ideas* of movement; for a man, meditating in language, and not speaking out his thoughts, can consolidate his trains so as to remember them afterwards.

When we proceed to Sensations and the Ideas, or subsequent traces, of Sensations, and take together with these the variety of our movements with their ideas, we find unlimited scope for the associating principle; and the consequences of its operation spread far and wide in the domains of our happiness, our knowledge, and our active capacity. It is possible here only to present a few illustrative examples.

In the various mechanical acquirements, which include the whole of special handicraft industry and skill, as well as the use of the bodily members in the more general actions of daily life, there may be traced the linkings of actions with actions, or actions with sensations and ideas. The helmsman steering a ship associates in his mind each deviation of the needle from the proper point with the specific muscular exertion to be applied to the wheel to rectify the ship's direction. The workman fabricating in wood, metal, or stone, acquires a firm connection between each aspect of the material and the muscular power to be applied to bring it one step nearer the desired form. The power of copying anything that we see, as in writing, draw-

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ing, molding, etc., when completely mastered, is made up of associations between a visible appearance and the train of movements calculated to reproduce it. After practice, all this is done, as it is called, mechanically, or without those operations of considering, willing, and remembering directions, that are essential to the learner in a new art. The associations that grow up after a certain amount of practice are in this case associations between movements and appearances to the eye, or sensations of sight. In the greater number of crafts, the eye is the guiding sense to the operator, but not in all. Sometimes the effect is vocal, as in performing music, and in making and tuning musical instruments, in speaking, etc. In other arts, the touch is the guiding sense, and in some, as in cookery, the taste and smell direct the operator. Each accomplished workman has in his mind many hundreds, not to say thousands, of couples or aggregates of definite movements with other movements and with sensations, contracted in the course of his apprenticeship to his calling.

Of the circumstances that favor and promote this extensive circle of acquisitions, several may be named as important. In the first place, *a natural activity of temperament*, or an abundant flow of power to the active members, as shown in a great and various mobility of the frame, is a good basis of bodily acquirements. When a force of the system runs feebly towards the muscular framework, being perhaps expended in other ways, as in the thinking powers, more time is requisite to attain difficult mechanical arts. Another important circumstance is *acuteness or delicacy of the sense* involved in the operation. A keen eye, sensitive to minute degrees of effect, is wanted in all the various occupations that turn on visible appearances; a good ear is indispensable to music and the arts of producing sounds, and so on. With a naturally dull sensibility to flavor, no man can easily become a good cook, or a taster of tea or wine. The third consideration is *the natural power of adhesive association* belonging to the individual character. Some minds have originally a more powerful adhesiveness than others, either for things generally, or for special departments. We see this when a number of boys come together at school, and in apprentices learning together. Some are always found taking the start of the rest in rapidity of acquirement; and although the reason may be found in some of the other circumstances now mentioned, yet observation shows that when everything else is allowed for, there remain natural differences in the rapidity with which the adhesive bond is cemented; some acquiring without effort what others take both time and labor to accomplish. The fourth principal circumstance is the *interest* taken in the work, or the degree to which it engages the feelings of the learner. This is a material consideration, accounting for the acquisitions made in matters that we have a strong taste for without our having a pre-eminence in those other points that constitute natural capacity. These four conditions apply more or less to acquisition generally.

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A detailed exemplification of this great principle of our nature might be given through all the departments of the human intellect. The acquirements of speech, as already said, contain a wide range of instances. The adhesion of language is partly in the vocal organs, partly in the ear, and partly in the eye, when we come to written and printed characters. The associations of names with things, with actions (as in obeying direction and command), and with other names (in acquiring foreign languages), are a gradual growth favored by such conditions as the above. The acquirements in Science, Fine Art, and Business, and in everything that constitutes skill or knowledge, proceed upon this plastic property of the mind. It also enlarges the sphere of our pleasures and pains. There are connections established in the mind between our states of feeling and the things that have often accompanied them, so that the accompaniment shall have power to revive the feeling. It is thus that we contract affections, both benevolent and malevolent, towards persons and things, our friends, our home, our country, our property, our pursuits.

This power of stirring up dependent associations to an extent that may be almost called unlimited (though there are limitations), is peculiar to the animal organization. Nothing parallel to it occurs in the mineral or vegetable world. It is a property of mind alone, and has its seat in the nervous tissue. We know that growth or change is requisite to the progress of the adhesion; for it proceeds most rapidly in youth, health, and nutrition, and decays in old age, and during exhaustion and disease. And even to keep our acquisitions from fading away, it is requisite that they should be occasionally revived. A language acquired in early years may be utterly lost by disuse. Sustained practice seems particularly necessary in early education; children's acquisitions are very liable to disintegrate, if not kept up and confirmed by new additions.

Law of Similarity.—This may be expressed as follows: *Present* Actions, Sensations, Thoughts, and Emotions tend to revive their LIKE among *previous* impressions.

If the mind worked only by the principle of contiguity, nothing would ever occur to us except in some connection already formed. But some explanation is necessary as to the precise relationship subsisting between the two distinct forces of mental resuscitation, in order to show at once their distinctness and their connection. When the cohesive link between any two contiguous actions, sensations, or ideas, is confirmed by a new occurrence or repetition, it is obvious that the present impression must revive the sum-total of the past impressions, or reinstate the whole mental condition left on the occasion immediately preceding. Thus, if I am disciplining myself in the act of drawing a round figure with my hand, any present effort must recall the state of the muscular and nervous action, or the precise bent acquired at the end of the previous effort, while that effort had to restore the condition at the end of the one preceding, and so on. But this reinstatement of a former condition by a present act of the same kind is really and

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truly a case of the principle before us, or of like recalling like; and without such recall, the progressive adhesion of contiguous things would be impossible. It would appear, therefore, that similarity is tacitly assumed in the operation of contiguity, and is indispensable to the process by which our acquisitions are gradually built up. Why, then do we set up the associating force of likeness as something independent and distinct? To answer this question, we must advert to the fact, that in those cases where the same impression is deepened by every new repetition, the old and the new are not merely similar, they are *identical*, and the resuscitation takes place without fail, and as a matter of course. But in going deeper into the explanation of the human intellect, we encounter many classes of similars, where there is not absolute identity, but the mixing up of a certain amount of *diversity* with the likeness actually existing. The botanist classing together all the plants of the same order, as, for example, the *Rosaceæ*, has to be struck with the occurrence of certain common characters—viz., the properties that distinguish the order—in the midst of great varieties in all other respects. It is important that he recognize these general marks, whether the plants be trees or shrubs, whether they be poisonous or wholesome, and under many other diversities. It is exceedingly important in science, in the business of life, and even in the creations of fine art, that the mind should take cognizance of likeness surrounded by unlikeness; which is the case that renders it necessary to characterize as distinct the associating force now under discussion. In the case of perfect identity between a present and a past impression, the past is recovered, and fused with the present, instantaneously and surely. So quick and certain is the process, that we lose sight of it altogether; we are scarcely made aware of the existence of an associating link of similarity under such circumstances. But when we pass from complete to incomplete or partial identity, we are more readily led to perceive the existence of this link of attraction between similars, for we find that the restoration sometimes does not take place; cases occur where we fail to be struck with a similitude: the spark of resuscitation does not pass between the new impression and the old dormant one. Then it is that we recognize differences between different minds; one man tracing resemblance and making out identity better than another. Moreover, we can assign reasons connected with the culture of the individual, which partially explain superiority or inferiority in this important faculty; just as we have pointed out the conditions favorable to the rapid growth, of the adhesive bond of proximity. The failure in reinstating an old impression by virtue of a present one like it, is ascribable solely to the want of complete identity. When in some new presentation of an object, the old familiar form is muffled, obscured, distorted, disguised, or in any way altered, it is merely a chance if we recognize it; the amount of likeness still remaining will have a tendency to revive the object, while the points of difference or un-

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likeness will operate against the revival, and tend to restore things of their own kindred. If we hear a musical air that we are accustomed to, the new impression revives the old as a matter of course; but if the air is played with complex harmonies and accompaniments which are strange to us, it is possible that the effect of these additions may be to check our recognition of the melody; the unlike circumstances may repel the reinstatement of the old experience more strongly than the remaining likeness attracts it. If our hold of the essential character of the melody is feeble, and if we are stunned and confounded by the new accompaniments, there is every probability that we shall not be put upon the old mental track made by the same air; in other words, we shall not identify the performance.

A few examples may show the workings of this associating power, and the consequences thence arising. The intellectual operations known under the names Classification, Generalization, Induction, and Deduction, all proceed upon the discovery of likeness among things lying wide asunder in space and time, and very often veiled by diversity. Thus, in order to include in one list all the species of the *rose*, botanists have had to trace the characters of the genus through its various members, wherever they occur, and under the greatest differences in every other respect. It takes a keen identifying faculty—that is, a strong natural tendency for the resurrection of like to meet like—to see the resemblance of some of these species to the rest; and it has happened in many departments of knowledge that a class has remained incomplete for a time, purely from the disguised character of some of the individuals. So in the process termed *induction*, by which a general law is arrived at by comparing instances of it everywhere, there must be an attraction of similars, in order to bring together in the mind the collection of particulars that the induction is based upon. Thus, Newton assembled in his view the various transparent bodies that he had found in the course of his experiments to refract or bend light strongly, his only intellectual instrument for doing so being the bond of likeness operating as a power of recall. Having looked at them in company, he saw that some were remarkable for their weight or specific gravity, and others for containing inflammable ingredients; upon which he raised the general induction, connecting these two properties with high refrangibility. Then, *deductively*, he applied this generalization to the diamond, which refracts light more than any other known substance; and as it is not a heavy material, he extended the other inference to it—namely, that it was made up of some inflammable material, an inference afterwards confirmed by the discovery that it is crystallized carbon. Many of the greatest discoveries in science have turned on the identification of modes of action never before supposed the same, as when Franklin was struck with the resemblance between the atmospheric thunder and lightning and the phenomena of common electricity.

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Another wide field for the operation of the same principle is the region of *illustrative comparisons*, whereby two things widely remote are brought together, in the view either to elucidate one another, or for the sake of ornament and poetic effect. Most men of genius in literature and poetry have contributed original illustrations, similes, metaphors, or comparisons in the course of their compositions. Shakespeare carries the palm in this faculty. The writings of Bacon are remarkably rich in those that serve the purpose of exposition. Science is with him the 'interpretation' of nature: final causes are 'vestal virgins'; they have no fruit: fallacies are 'idols.' Edmund Burke, another master of illustrative comparison, has termed revolutions the 'medicine' of the state, and regular government its 'food.'

An inquiry into the circumstances that render one mind more prolific in new identifications and comparisons than another, apart from difference of original capacity, must refer mainly to the fact that the one has had the greater previous familiarity with the class of things thus brought up by the attraction of similarity. A mathematician is the most likely person to bring up comparisons from mathematics; a botanist is prepared to identify plants; a travelled man provides illustrations from foreign countries; a historian, from history. The sailor is notoriously rich in nautical similes and illustrations. When any one not specially versed in a subject is yet prone to draw upon it profusely in the way of comparison, we must then refer to great natural endowment as the sole explanation. For a full exemplification of both the associating principles and of the complications that they give birth to, see Bain on *The Senses and the Intellect*.

The earliest known attempt to lay down the laws whereby thought succeeds to thought, is in Aristotle's treatise on Memory. He enumerates three different principles of mental resuscitation—viz., Similarity, Contrariety and Co-adjacency. He has been followed by most other philosophers as regards all the three principles. It is now, however, clearly seen and generally admitted, that contrariety is not an independent associating force. When a thing suggests its opposite or contrary, it will be found that the two have been previously together in the mind, and have therefore acquired a mutual hold by contiguity. Such, for example, are black and white, wet and dry, health and sickness, prosperity and adversity, etc. Contraries, in fact, have a natural inseparability; they are of the class of relatives like father and son, which imply each other necessarily, and have no meaning except by mutual reference. It requires no new principle of our constitution to account for suggestion in this particular case. Moreover, when things are strongly contrasted with one another, as high position before a fall, the mind is greatly impressed with the shock of transition, and so retains a lively recollection of the sequence, having by that means a greater tendency to pass from the one to the other. Thus, then, the enu-

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meration of Aristotle is reduced to the two principles that we have now expounded.

Hobbes recognized the principle of contiguity as the foundation of reminiscence; but the Aristotelian philosopher, Vives, who wrote in the 14th c., was the first to specify in minute detail the various circumstances that determine the adhesive bond of recollection. Hume's enumeration is well known to have comprised the three principles of resemblance, contiguity and causation, which he illustrates as follows: 'A picture naturally leads our thoughts to the original, [resemblance]. The mention of one apartment in a building naturally introduces an inquiry or discourse concerning the others, [contiguity]. And if we think of a wound we can scarce forbear reflecting on the pain which follows it, [causation].' Causation, however, is merely a case of contiguity; so also we may say of Order in Place, and Order in Time, which have been given as distinct principles.

An attempt has been made to generalize Similarity into Contiguity, but without success. For a full and critical view of the history of these laws see Sir W. Hamilton's edition of Reid.

ASSOILZIE, v. *ās-soyl'ē* [OF. *absoiller* or *assoiler*—from L. *ab*, from; *solvo*, I loose]: in *Scots law*, to free one accused from a charge; to find a criminal not guilty; to set at liberty. **ASSOILZIEING**, imp. *ās-soyl'ing*. **ASSOILZIED**, pp. *ās-soyl'id*. **ASSOIL**, v. *ās-soyl'*, in *OE.* to free from guilt; to release; to absolve. **ASSOIL'ING**, imp. **ASSOILED**, pp. *ās-soyld'*. **ASSOILMENT**, n. *ās-soyl'měnt*, acquittal; release.

ASSONANT, a. *ās'sō-nānt* [F. *assonant*—from L. *as'sōnans* or *assōnan'tem*, assonant, resounding—from L. *ad*, to; *sonans*, sounding]: resembling in sound. **ASSONANCE**, n. *ās'sō-nāns* [F.]: resemblance of sounds.

ASSORT, v. *ās-sört'* [F. *assortir*, to match, to agree—from L. *ad*, *sortiri*, to cast or draw lots—from *sortem*, a lot: It. *sorta*, a sort, a kind]: to arrange or put in lots; to arrange into sorts or classes; to agree or suit. **ASSORT'ING**, imp. **ASSORT'ED**, pp.: **ADJ.** put in lots; arranged. **ASSOR'TER**, n. one who. **ASSORT'MENT**, n. the act of separating into lots or arranging into classes; a number of things of the same kind.

ASSOUAN, *ās-swān'*, or **ESSUAN'**, or **ESWAN'**, ancient Syene: town of Upper Egypt on the bank of the Nile, near the borders of Nubia; 110 m. s. of Thebes; lat. 24° 5' 30" n., long. 32° 54' e. There are few remains of the ancient city. Some granite columns present themselves among the ruins, but do not seem of an early date; and part of a temple stands with a dilapidated portico. Of the town-wall that part to the s. of the old town is still standing; and beyond it is the cemetery of A. where there are numerous tombs, mostly cenotaphs with Arabic inscriptions. In the neighborhood are several granite quarries, some of them remarkable for remains of ancient material cut from the rock, and partially hewn, and for antique inscriptions and tablets, announcing the removal of blocks and the

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reign of the Egyptian monarch by whose order they had been quarried. The environs of A. are sterile and sandy; but the palm thrives, and the dates, which are excellent, form the staple of the trade. Some traffic is carried on in senna, henna, charcoal, wicker-baskets and slaves.

The ancient name Syene is the Coptic word *souan* or *suan*, signifying 'opening;' and the modern one is formed by adding the Arabic *el*, 'the,' softened into *es*, viz., *Es-suan*, 'the opening.' A. and its vicinity are highly interesting to geologists and mineralogists; the kind of granite called syenite receives its name from the town.

ASSUAGE, v. *ās-swāj'* [OF. *assouager* or *asoager*, to relieve, to assuage—from L. *ad*, to; *suāvis*, sweet]: to soften; to mitigate, to allay; to abate or subside. ASSUAG'ING, imp. ASSUAGED, pp. *ās-swāj'd'*. ASSUAGE'MENT, n. mitigation. ASSUA'GER, n. one who. ASSUASIVE, a. *ās-swā'zīv*, softening; alleviating; soothing; mitigating.—SYN. of 'assuage': to allay; alleviate; relieve; pacify; mitigate; soothe; calm; tranquillize; appease.

ASSUBJUGATE, v. *ās-sūb'joo-gāt* [L. *ad*, and *subjugate*]: in *OE.*, to subjugate; to bring into subjection.

ASSUE'TUDE, n. *ās'wě-tūd* [L. *assuetudo*, custom—from *ad*, *sūesco*, I become used]: custom; habit.

ASSUME, v. *ās-sūm'* [F. *assumer*, to assume—from L. *assūmērē*, to take to myself—from *ad*, to; *sūmo*, I take; *sumptus*, taken]: to take a person or thing to one's-self; to take upon one's-self; to appropriate; to pretend to possess; to take for granted without proof. ASSUM'ING, imp.: ADJ. haughty; arrogant. ASSUMED, pp. *ās-sūm'd'*. ASSUM'INGLY, ad. *-lī*. ASSUM'ER, n. one who. ASSUMPTION, n. *ās sūm'shūn* [OF.—from L. *assumptus*, taken to one's-self]: the act of taking to one's-self; the act of assuming; supposition; the taking up into heaven, applied by Rom. Catholics to the Virgin Mary. ASSUMP'TIVE, a. *-tīv*, that may be assumed. ASSUMP'TIVELY, ad. *-tīv-lī*. ASSUMPSIT, n. *ās-sūmp'sīt* [L. he has taken to himself]: in *law*, a voluntary promise to perform for, or to pay to, another; an action to recover damages for non-performance of promise.—SYN. of 'assume': to arrogate; usurp; appropriate; affect; pretend; apprehend; imagine; suppose; presume.

ASSUMP'TION: village and river of Lower Canada. About 8 m. below the village, the river flows into the St. Lawrence, or rather into the Ottawa, nearly opposite the lower extremity of the island of Montreal.

ASSUMPTION: city, cap. of Paraguay: see ASUNCION.

ASSUMP'TION OF THE VIRGIN MARY: a festival of the Roman and Greek churches, celebrated Aug. 15. In the 6th c., the idea that the soul and body of the Virgin had been carried up to heaven by Christ and his angels, which had originated in a Gnostic legend of the 3d or 4th c., began to gain credence in the church; and in the East at the beginning of the 7th c. (in the West at the beginning of the 9th c.) the festival of the A. was instituted in commemoration of the event. Until then, from the 4th c.

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the same date had been observed in memory of her death. Liguori, in his *Glories of Mary*, gives a very minute account of the circumstances of her Assumption.

ASSUR'ANCE: see INSURANCE.

ASSURANCE, COMMON: described by Blackstone as the legal evidence of the translation of property, whereby every man's estate is assured to him, and all controversies, doubts, and difficulties are either prevented or removed. For common assurances or *conveyances*, see DEED and CONVEYANCE.

ASSURE, v. *ă-shôr'* [F. *assurer*: OF. *asseurer*, to secure, to prop up—from mid. L. *ass̄cūrārē*, to give security by a pledge—from L. *ad*, to; *secu'rus*, sure, certain]: to make sure by a token of good faith; to make certain; to give confidence by a promise; to insure, ASSUR'ING, imp. ASSURED', pp. *ă-shôrd'*: ADJ. certain; convinced; boldly confident; in *OE.*, affianced. ASSUREDLY, ad. *ă-shô'rěd-lĭ*. ASSUR'EDNESS, n. the state of being assured. ASSUR'ER, n. ASSURANCE, n. *ă-shô'rāns*, a declaration to dispel doubt; the utmost certainty; impudence; conviction; a contract to make good a loss by death or by fire, now restricted to life contingencies. — SYN. of 'assure': to assert; vouch; avouch; declare; aver; protest;—of 'assurance': impudence; boldness; audacity; hardihood; effrontery; shamelessness: confidence; hope; expectation; trust.

ASSURGENT, a. *ăs-sér'jěnt* [L. *assurgen'tem*, rising up—from *ad*, to; *surgo*, I rise]: in *bot.*, rising upwards in a curve.

ASSWAGE, v. *ăs-swāj'*: old spelling of ASSUAGE, which see.

AS'SYNT: mountainous, moorish, and very rugged dist. or parish, 25 m. long, 15 broad, in s.w. Sutherlandshire; consisting mostly of a network of rocky heights, interspersed with a multitude (200) of dark, motionless tarns or pools, of various sizes, with some large lochs, the largest Loch Assynt, 6½ m. long and 1 broad. The district consists of gneiss, Silurian rocks, and primitive limestone. There are a dozen mountains 2,000–3,273 ft. high. Some of the mountains are covered with white bleached stones and protruding rocks like patches of snow. The mountains have frequently the form of artificial pillars and cairns, and are the remains of an enormous denudation of the nearly horizontal strata of the district. Suilven is in form a sugar-loaf, rising 2,399 ft. above the sea, amid a rugged table-land of lower gneiss hills. To Ardvreck Castle, on a promontory on the east side of Loch A., the great Marquis of Montrose was brought prisoner, 1650.

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ASSYRIA, *ās-sīr'ī-ā*: (called Athura on Persian cuneiform inscriptions, and Assura on the Median): the northernmost of the three great countries that occupied the Mesopotamian plain; bounded on the n. by the Niphates Mountains of Armenia; on the s. by Susiana and Babylonia; on the e. by Media; and on the w., according to some, by the Tigris, but more correctly by the water-shed of the Euphrates, for many Assyrian ruins are found w. of the Tigris. It was thus about 280 m. long from n. to s., and rather more than 150 broad from e. to w. This plain is diversified by mountain-chains on the n. and e., and watered by the Tigris and its affluents, between two of which—the Zab rivers—lay the finest part of the country, called Adiabené. As it was the boundary-land between the Semitic people and Iran, it became the scene of important political events. Its extraordinary fertility enabled it to support a large population. The high degree of prosperity and civilization reached by its inhabitants in very early times is attested not only by ancient writers, but by the extensive ruins of mighty cities, by the canals and contrivances for irrigation, and by the many proofs—furnished by recent excavations—of an acquaintance with the arts and sciences. The ruins of many cities are grouped around Nineveh; while lower down the Tigris exhibits an almost unbroken line of ruins from Tekrit to Bagdad. Under the Mohammedans, this fine country is now almost a desert.

History.—Ancient authorities differ widely from each other respecting the rise and progress, the extent and the duration of the Assyrian empire. Ctesias, a Greek of Cnidus, court-physician to Artaxerxes Mnemon, is quoted by various ancient writers; and his information, though utterly incredible and fabulous, has been followed by most classical historians, and by the whole series of ecclesiastical writers. Many ingenious but futile attempts have been made to reconcile his history with the Scripture narrative. Berosus, a priest of Bel at Babylon, who wrote about B.C. 268, and Herodotus, differ widely from Ctesias, but are confirmed in many important particulars by the Bible, and by the continually increasing evidence derived from cuneiform inscriptions.

In the Bible narrative, we are told that Nineveh was founded by Asshur from Babylon (Gen. x. 11). The latter city therefore must have been the capital of a more ancient empire, as Berosus asserts, and recent discoveries go far to prove, though Greek writers maintain the reverse. The next notice we have of A. does not occur till B.C. 770, when Pul, king of A. invaded Palestine, but was bought off by Menahem, king of Israel. Tiglath-pileser, who succeeded Pul (B.C. 738), conquered Syria, and carried off many of the Jews into captivity. Next Salmaneser (B.C. 731) subdued Israel, which, at the instigation of the Egyptians, had refused to pay tribute. The next is Sennacherib (B.C. 713), who attacked Egypt, and threatened Judah under Hezekiah. He was slain by his two sons, and succeeded by his son Esarhaddon, who was also master of

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Babylon (2 Chron. xxxiii. 11), which, under Nabonassar, had been independent of Nineveh since B.C. 747. Very little credit is to be attached to the expedition of Holofernes recorded in the book of Judith.

After this, the empire appears to have gradually decayed, until at last, in the reign of Sardanapalus II., or Saracus, a league was formed for its destruction between Nabopolassar, governor of Babylon, and Cyaxares, king of Media, which was strengthened by the marriage of Nebuchadnezzar, son of the former, to Nitocris, daughter of the latter. The war and siege are said to have been interrupted by an invasion of the Scythians, which drew off Cyaxares; but at length Nineveh was taken and destroyed about B.C. 606, or, according to Rawlinson, 625. In the time of Darius Hystaspes, A. rebelled without success in conjunction with Media. In the time of Herodotus, the capital had ceased to exist; and when Xenophon passed it, the very name was forgot, though he testifies to the extent of the deserted city, and asserts the height of the ruined walls to be 150 ft. An inconsiderable town seems to have existed on its ruins in the reign of Claudius; and the last notice we have of Nineveh in the classics is in Tacitus.

According to the Greek legends, the Assyrian empire was founded by Ninus. To this monarch and his consort Semiramis are ascribed expeditions on an incredibly magnificent scale against Bactria, Ethiopia, and India. We are told that Semiramis led an army of 3,000,000 infantry, 500,000 cavalry, and 100,000 chariots, and a fleet of 2,000 ships, and was encountered by forces more numerous still, and defeated; that she returned to Nineveh, where she soon afterwards died, and was reckoned among the gods, and was succeeded by her son Ninyas, an effeminate prince. The succeeding part of the history as related by Ctesias is equally false, though that writer managed to make the ancient world give credit to his narrative in preference to that of Herodotus. He gives a list of monarchs from Ninus to Sardanapalus, which is now considered a clumsy forgery. According to him, for thirty generations after Ninyas, the kings led a life of luxury and indolence in their palace; the last of them, Sardanapalus, made a vigorous defense against Arbaces, the rebel governor of Media, but finding it impossible to defend Nineveh, he set fire to his palace, and burnt himself with all his treasures; this event took place 1,306 years after Ninus. Now, the above account represents Nineveh to have perished nearly three centuries before the real date, which was about B.C. 605; also it is utterly incompatible with Scripture. Herodotus assigns to the empire a duration of 520 years, and Berosus of 526. In order to reconcile these conflicting accounts, historians have supposed that Nineveh was twice destroyed, but this supposition is now generally rejected. However, that Nineveh was actually destroyed by fire is proved from the condition of the slabs and statues found in its ruins, which show the action of intense heat.

A. became a Median province B.C. 605, and afterwards in conjunction with Babylonia, formed one of the satra-

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pies of the Persian empire. In B. C. 331 A. at Gaugemela, near Arbela, in A., Alexander defeated Darius Codomannus. In B.C. 312, A. became part of the kingdom of the Seleucidæ, whose cap. was Seleucia, on the Tigris. It was afterwards subject to the Parthian kings, whose cap. was Ctesiphon, and was more than once temporarily in possession of the Romans. When the Persian monarchy of the Sassanides was destroyed by the successors of Mohammed, A. was subject to the caliphs. Their seat was Bagdad from A.D. 762-1258. It has been under the Turks from 1638, at which period it was wrested from the Persians.

Some historical points now to be mentioned have been satisfactorily ascertained from the cuneiform inscriptions. For these we are indebted to Rawlinson's *Herodotus*.

It has not been ascertained when A. first became independent of Babylon (q.v.). The seat of government was first at Asshur (now *Kileh-Shergat*), on the right bank of the Tigris, 60 m. s. of the later capital, Nineveh. At this place have been found the bricks and fragments of vases bearing the names of the earliest known Assyrian kings, for Ninus and Semiramis are to be considered mere inventions of Greek writers. The earliest known king is *Bel-lush*, one of a series of four. These reigns probably occupy from B.C. 1273 to 1200. Of the next series of six, the names of five are recorded on the famous Kileh-Shergat cylinder, the earliest purely historical document as yet discovered in Mesopotamia.

Tiglethi-nin, the last of the Kileh-Shergat series, was succeeded by his son, Asshur-dani-pal, the warlike Sardanapalus I. of the Greeks. He made Calah, the modern *Nimrud*, his capital, 40 m. further n. on the left bank of the Tigris. His annals are very complete. Among other conquests, he mentions that he had taken tribute from Tyre, Sidon, and other Phœnician cities. He was founder of the n.w. palace at Nimrud, which, next to that of Sennacherib at Koyunjik, is the largest and most magnificent of all the Assyrian edifices. The greater portion of the sculptures now in the British Museum are from this building.

Sardanapalus I. was succeeded by his son Shalmanubar, whose deeds are briefly recorded on the black obelisk now in the British Museum, the full account being apparently reserved for the colossal bulls, which seem to have been the usual dedication after a victory. Of his campaigns, the most interesting to us are those in which he defeated Benhadad of Damascus, and Ben-hadad's murderer and successor Hazael. According to his own account, Shalmanubar defeated Hazael, killing 16,000 of his fighting-men, and capturing more than 1,000 chariots (B.C. 884.). The obelisk also records the tribute paid by *Yahua, son of Khumri*, i.e., Jehu, son of Omri, king of Israel. Now Jehu was son of Jehoshaphat, and had done his utmost to extirpate the family of Omri: but probably Jehu, like other usurpers, was anxious to identify himself with the family which he had dispossessed, and of course the Assyrians accepted the title he gave himself,

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Iva-lush, probably the Pul of the Scriptures, is recorded on a pavement-slab from Nimrud to have received tribute from Samaria, Tyre, Damascus, Idumæa, and Palestine, which assertion agrees with the account given (2 Kings, xv.) of the 1,000 talents paid by Menahem. With this king ends the first dynasty, in which we have 18 monarchs from Bel-lush to Iva-lush (B. C. 1273-747).

The later Assyrian empire begins with Tiglath-pileser II. (B.C. 747), and ends with the destruction of Nineveh (B.C. 625). It is plain from Scripture that the empire was in a flourishing condition during the reigns of those kings who came in contact with the Hebrews, and this account exactly accords with the monuments, but contradicts Herodotus. Probably, on the accession of Tiglath-pileser II., Babylon had revolted, and this partial rebellion had reached Herodotus in an exaggerated form. The annals of this prince exist in only a very fragmentary state. The name of his successor, Shalmaneser, has not yet been found on the monuments. The capture of Samaria is usually ascribed to this prince, but his successor, Sargon, expressly asserts that Samaria was taken by himself in his first year. Sargon's palace at *Khorsabad*, near Nineveh, furnished the valuable series of monuments now in the Louvre. Sargon was succeeded by his son, Sennacherib. He fixed the seat of government at Nineveh, and employed the forced labor of 360,000 men to repair the great palace. Later in his reign he built a new and more magnificent edifice, which he decorated with sculptures representing his various exploits. This is the palace excavated by Layard. It contained at least three spacious halls—one of them 150 ft. by 125, and two long galleries, one of 200, the other of 185 ft., besides innumerable chambers. The excavated portion covers above eight acres. The annals of Sennacherib extend only to his eighth year. He relates at length his successful attack upon Babylon, his invasion of Judæa, the submission of Hezekiah, and his deportation of 200,000 Jews. This expedition is not to be confounded with the second invasion, in which he failed ignominiously, and which is not recorded on his monuments. His assassination very shortly after his return from Nineveh, after his second expedition, readily accounts for this silence.

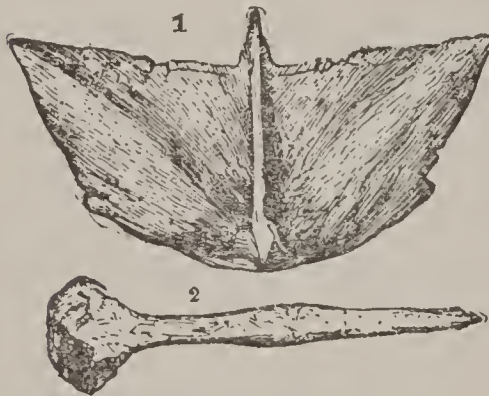
Esarhaddon, his son and successor, held his court sometimes at Nineveh, sometimes at Babylon. Bricks bearing his name have been discovered at *Hillah*, and a tablet at Babylon dated in his reign. This explains how Manasseh was brought to him at Babylon, when he was led captive from Jerusalem (2 Chron. xxxiii.) No record has yet been discovered of this expedition against Palestine. His edifices are not inferior to those of his predecessors. He employed Greek and Phœnician artists, and to them probably are due the beautiful bas-reliefs that adorn the edifices of his erection. The decline of the empire probably commenced with Asshur-bani-pal II. The arts of peace flourished, while the military vigor of the nation declined. The sculptures of this reign are decidedly superior to the earlier in spirit, delicacy, and freedom from conventionality.



Assyria.—Sennacherib at the Head of his Army. (Height 38 inches.—British Museum.)



Assyria.—The God Nergal. (British Museum.)



1 Hyoid plate of *Asterolepis*, 1-9th natural size; 2, Internal ridge of hyoid plate, 1 4th natural size.



Sir Francis Drake's Astrolabe.—Royal naval collection.

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The slabs show that hunting, not war, was this king's favorite pursuit. He was succeeded by his son, Asshur-emitili, the last king of whom any records have yet been discovered. It is uncertain whether Nineveh was destroyed under him or under a successor, the Saracus of Berosus, the effeminate Sardanapalus of the Greeks. The character usually given of this last king, as a debauchee throwing off his indolent habits, and after performing prodigies of valor, perishing by a glorious death, rather than surrender, is derived solely from Ctesias. All we distinctly know is that, finding himself betrayed to the Median king by Nabopolassar, governor of Babylon, he set fire to his palace and perished in the flames.

A singularly important cuneiform discovery was made by Mr. George Smith of the British Museum, the substance of which was made public at a meeting of the Biblical Archæological Soc., 1872, Dec. While engaged on an examination of the collection of Assyrian tablets in the British Museum, Mr. Smith lighted upon a curious series of legends, including a copy of the story of the Flood. On discovering these documents, which were much mutilated, he searched over all the collections of fragments of inscriptions, consisting of several thousands of smaller pieces, and ultimately recovered 80 fragments of these legends. The tablets were originally at least 12 in number, forming one story or set of legends, the account of the Flood being on the 11th tablet. Of the inscription describing the Flood, there are fragments of three copies, containing duplicate texts. These texts belong to the time of Asshur-bani-pal (abt. B.C. 660), and were found in the library of that monarch in the palace at Nineveh. The original text, according to the statements on the tablets, belonged to the city of Erech, and appears to have been either written in or translated into the Semitic Babylonian at a very early period. Mr. Smith is of opinion that its composition cannot be placed later than B.C. 17th c., while it may be much older. The Assyrian story of the Deluge is both like and unlike the Scripture narrative. The Flood is sent as a punishment for sin; the builder of the ark is called Sisit (the *Xisuthrus* of the Græco-Chaldæan Berosus); he gathers into the vessel all his male and female servants, all the sons of the army, and all the beasts of the field; the storm of rain lasts only six days, and yet submerges the whole earth; all life is destroyed; Sisit sends forth a dove which can find no resting-place, and returns; then a swallow, which is also forced to return; then a raven, which does not come back. The ark rests on a mountain, the animals are liberated, an altar is built by the grateful patriarch, and Bel, the Great God, makes a 'covenant' with Sisit. The minuter details of this Assyrian legend diverge greatly from the Hebrew account, and lead to the conclusion that in each we have an independent tradition of some great natural catastrophe in the early ages of human history. Mr. Smith notices that the biblical narrative is the version of an inland people; the name of the ark in Genesis means a chest or box, and not

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a ship; there is no notice of the sea or of launching, no pilots are spoken of, no navigation is mentioned. The inscription, on the other hand, belongs to a maritime people; the ark is called a ship, the ship is launched into the sea, trial is made of it, and it is given in charge to a pilot. This seems to point to the Persian Gulf as the birthplace of the old legend. Mr. Smith returned in 1874 from Chaldæa, and gave an account of his valuable discoveries in a work entitled *Assyrian Discoveries* (1875). Believing that many more legends and histories lay beneath the ruins of the ancient cities of Chaldæa, he was on his way to prosecute his third exploration, when he succumbed to the hardships and privations of the task, and died at Aleppo, 1876, Aug.

Government.—The government was despotic, as suited the character of the people. The empire was a mere congeries of kingdoms bound to the supreme authority only by certain obligations of paying tribute, giving presents, and showing due respect. Each kingdom retained its own rulers, laws, and religion, although we do find some attempts to rule by satraps and collectors of tribute. Tiglath-pileser also boasts, in an inscription, of having punished and crucified the Chaldæans who refused to worship his gods. In consequence of this imperfect organization, the empire was exposed to frequent revolts of the subject nations, when such opportunities offered as a disputed succession, or want of energy in the ruling prince. Then the labor of conquest had to begin anew, and it was sought to diminish the danger of the central power by inflicting severe punishments on the rebels. The history of the Jews has made us familiar with one of these devices—viz., the wholesale deportation of the inhabitants of the offending district. It may be readily believed that such an empire, though imposing from the magnificence and wealth of the capital, yet, from the impoverishment and weakness of the subject states, was continually liable to fall to pieces, and was ill-fitted to resist an attack from without. That A. did actually last for five centuries, was owing to its long succession of warlike princes, and to the energy of the population.

Religion.—The religion of the Assyrians was nearly identical with that of the Babylonians. It was a gross polytheism, their gods being thousands in number, and each village having its own particular deity. From thousands of theological tablets now in the British Museum, it is known that each divinity had many names, and some of them as many as fifty titles besides. Again, many deities prominent in the Babylonian pantheon are either unknown or subordinate in the Assyrian. Besides, the same gods did not remain equally popular throughout. The supreme god was Asshur, probably the deified patriarch. His worship was confined to Assyria. He is generally associated in the inscriptions with *Nin* and *Nergal* (2 Kings, xvii. 30), who are represented by the man-bull and the man-lion. The winged globe, so often seen in the sculptures, from which a figure with a horned

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helmet shoots his arrows, is supposed to be the emblem of Asshur. Next in rank is the governing triad, answering to the Pluto, Jupiter, and Neptune of the classical mythology; the next group corresponds to Æther, the sun and the moon; then five inferior deities, representing the five planets. Each god is associated with a goddess. Mylitta, or Beltis, is the 'queen.' The male and female powers of the sun are represented in the Scripture phrase, 'Adrammelech, and Anamelech, gods of Sepharvaim'—that is, of Sippara, a town a few miles above Babylon. *Bel-merodach* was originally an inferior deity, son of Hêa, the fish-god; but under the later Babylonians, we find him monopolizing the greater part of the homage which used previously to be divided among several. Nisroch (2 Kings, xix., 37) has not been yet ascertained. Nebo (Isaiah, xlvi.) is one of the five planetary gods, and corresponds to Mercury. The systems of notation, divisions of time, the planets and stars, animals and metals, divination and astrology, were all more or less closely connected with theology.

Ethnology.—The Assyrians have been assigned by some ethnologists to the Aryan race, but it is now generally acknowledged that they were a branch of the Semitic family of nations, and therefore were members of the same grand division of the human race as the Syrians, the Phœnicians with their colonies, the Jews, and the modern Arabians. In B.C. 20th c., Semitism, as a distinct ethnic element, appears to have first developed itself. The original races variously called Scythic, Turanian, or Tatar, appear to have once been spread over the whole space from the Caucasus to the Indian Ocean, and from the Mediterranean to the mouths of the Ganges. Their type of language has continued to our time to exist in four-fifths of Asia, and in some of the remoter corners of Europe, as among the Finns, Lapps, Turks, and Hungarians. In Mesopotamia, and in the valley of the Nile, where natural advantages induced men early to form settled communities, the rude and inartificial type of language was developed into Hamitism, and afterwards still further improved into Semitism. Then seems to have commenced a series of migrations. Asshur went forth probably at this time from Babylon to A., Abraham and his followers to Palestine, the Joktanian Arabs to Arabia. From these seats, Semitism was afterwards carried to Cyprus, to the s. seaboard countries of Asia Minor, to Carthage, Sicily, Spain, and Western Africa.

The traditions of A. indicate a very early connection between Ethiopia, Arabia, and the cities on the Euphrates. Mesopotamia undoubtedly contained a large proportion of Arabians, and this accounts for the fact that Herodotus styles Sennacherib king of the Arabians and Assyrians. The Chaldæans, colonies of whom were planted in Armenia by the Assyrian kings, are supposed by some to have been a foreign tribe, which had immigrated from the n., and become a priestly caste. But the *Akkad* race, of which the Chaldæan is a tribe, is with more probability thought

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to have inhabited Babylonia from the remotest times, and by it the earliest civilization in Mesopotamia was originated. Probably the art of picture-writing was possessed by the Hamitic tribes who lived in the valley of the Nile, and passed eastward to the Euphrates. The *Akkad* language appears to have been formed before Semitism attained its peculiar development and organization. Long after Semitism had become predominant in Mesopotamia, the *Akkad* or Chaldæan alphabet continued to be the scientific language in which all the tablets relating to mythology, astronomy, or science, as well as most historical and official records, were written. This alphabet was adopted with certain modifications by the Semitic tribes, which became predominant in Assyria. The cuneiform characters were elaborated from the forms of natural objects, and gradually became phonetic from being symbolic, and for convenience of engraving, assumed the form of arrow-heads instead of the rounded and flowing forms which are introduced by the use of plastic materials. After the Aryan race had spread more extensively in Western Asia, the Persian monarchs, when they wished to make any communication to their subjects generally intelligible, found it necessary to publish it in three languages belonging to the principal divisions of human speech; hence the trilingual inscriptions of Behistun, etc., which consist of an Indo-European, a Tatar, and a Semitic column. It is still necessary in many places to employ three tongues, representatives of the three families, Persian, Turkish, and Arabic.—See Lenormant, *La Langue Primitive de la Chaldée*.

Antiquities, Civilization, etc.—The excavations carried on by M. Botta, French consul at Mosul, and by Layard near Mosul, Khorsabad, and Koyunjik, have laid open palaces



Lion-hunt.
(From the Northwest Palace at Nimrud.)

and buildings full of sculptures, all covered with inscriptions, in deciphering which considerable progress has been made, and more may be expected. Among the most remarkable monuments now in the British Museum are two winged, human-headed lions, 12 ft. high, and 12 ft. in length; winged human-headed bulls of similar dimensions with the lions; winged sphinxes; and the famous obelisk

ASSYRIAN—ASTACUS.

of black marble, sculptured on the four sides. On this last are represented a victory, a prisoner prostrate at the feet of the king, and foreign people offering tribute, and leading such animals as the Bactrian camel, elephant, lion, and rhinoceros—animals found only in lands far e. of the Tigris. The bas-reliefs are very numerous, exhibiting especially war and hunting. The march, the onset, the pursuit, the siege, the passage of rivers, the submission and treatment of captives, secretaries noting the number of heads taken in battle, and the amount of spoil; the chase of the lion, of the antelope, of the wild ass, and other animals—such are the favorite subjects of the Assyrian sculptor. Nor are they treated in the conventional style of Egypt, but in a manner which, for grace, spirit, correctness, and delicacy of execution, excels everything else known in Asiatic art. The artists follow some modes of representation different from the modern; for instance, a bull has five legs given him, in order that from all points of view he may be seen with four; a ladder stands edgewise against a wall, to show it is not a pole. A truthful impression is always aimed at. The labor bestowed on the careful finish of a priest's dress, and in the tasteful decoration of an article of furniture, proves them to be the work of an ingenious and painstaking people. From the bas-reliefs we gain little information respecting the private life of the Assyrians. There are a few which represent the foddering of cattle, women riding on mules, etc.

It is natural to suppose that Nineveh—a wealthy and luxurious city—imported many of the products of other countries, yet the manufactured goods would mainly be of home production. The jars, bronzes, glass bottles, carved ornaments in ivory and mother-of-pearl, engraved gems, bells, earrings, arms, utensils, are of excellent workmanship. The ornaments especially are in good taste, and evince no inconsiderable skill in the working of metals. Transparent glass was not unknown, nor the use of the lens as a magnifying agent. The Assyrians knew the principle of the arch, the use of the lever and roller, and the construction of aqueducts and drains. In the arts of peace, they appear to have been not inferior to any ancient nation; while their conquests, and the long duration of their empire, suffice to prove their capacity for war.—See Rawlinson's *Five Great Monarchies of the Ancient World, Chaldaea, Assyria, Babylonia, Media, and Persia*; George Smith's *Assyrian Discoveries* (1875), his *Assyria* (S.P.C.K.), and his *Babylonia* (new ed. by Sayce); and the article *Babylonia*, in the *Ency. Brit.*, 9th ed.

ASSYRIAN, a. *ă-sîr'î-ăn*: of or pertaining to Assyria: N. an inhabitant of. ASSYRIOLOGIST, n. *-ôl'ô-jîst*, one who makes the antiquities and history of Assyria his special study.

ASTACOLITE, n. *ă-stăk'ô-lîit* [Gr. *astăkos*, the crayfish or lobster; *lithos*, a stone]: a term applied to the fossil remains of crustaceans, like the crayfish or lobster.

AS'TACUS: see CRAYFISH: LOBSTERS.

ASTARTE—ASTER.

ASTARTE, *ās-tār'tē* (*Ashtaroth* in the Old Test.): chief female deity of the Phœnicians, Carthaginians, and Syrians (Syria Dea), worshipped also by the Jews in times when idolatry prevailed. A. was the original from which the Greeks borrowed their Aphrodite (q.v.). As Baal was god of the sun, A. was goddess of the moon. Her chief temples were in Tyre and Sidon. According to ancient accounts, her worship was of a licentious character. The oldest known image of her—that in Paphos—represented her simply under the form of a white conical stone. In Canaan and Phœnicia she was subsequently typified under the form of a cow, or sometimes she had only a cow's or bull's head; still later, her emblem became a star; and finally, she was conceived of as the 'queen of heaven,' sitting on a lion, her head surrounded with rays, and in the one hand a thunderbolt, in the other a sceptre.

ASTARTE: genus of Mollusca, with bivalve shells; type of a family *Astartidæ*, very closely allied to the *Veneridæ* or Venus family. It is interesting chiefly with reference to geologic changes and the history of life and organization, because only a few species are now known to exist, and these limited to the North Atlantic and Arctic oceans; whereas the fossil species are extremely numerous, commencing with the *lias* period, and distributed over the whole world. The *Astartidæ* may be regarded as having given place to the *Veneridæ*, which commenced with the oolitic period, and are among the most abundant bivalve mollusca of the present time.

ASTATIC, a. *ās-tăt'ik* [Gr. *a*, without; *statos*, that stands or remains]: being without polarity, as a magnetic needle; not being under the influence of a directive agent.

A-STAY': the position of an anchor when, during heaving, the cable forms an angle with the surface of the water in line with the stays of the ship.

ASTEISM, n. *ās'tē-izm* [Gr. *asteismos*—from *asteios*, urbane; *astu*, a city]: in *rhet.*, refinement of speech; urbanity of manners.

ASTELMA, n. *as-těl'ma* [Gr. *a*, without; *stelma*, a girdle]: genus of plants belonging to the order *Asteraceæ*. The species are beautiful Cape shrubs with 'everlasting' flowers.

ASTER, n. *ās'tēr* [Gr. *astēr*, a star]: genus of plants of the nat. ord. *Compositæ*, which Lindley has therefore chosen to call *Asteraceæ*. The flowers have a star-like arrangement. The ray and the disk are of different colors. The genus contains a great number of species, both herbaceous and shrubby, which have been arranged into six or seven groups, regarded by many as distinct genera. Only one species, *A. Tripolium* or *Tripolium vulgare*, the Sea Starwort, is a native of Britain. It is common in salt marshes. A number of perennial species are in cultivation as garden-flowers, of which the New-England A. (*A. Novæ Angliæ*) and the Michaelmas Daisy (*A. Tradescanti*), both

ASTERABAD—ASTEROID.

natives of N. America, are perhaps the most common, and, with some of the other species, are prized as among the comparatively few flowers to be seen at that dull season when autumn is giving place to winter. But the best known and most valued of all the asters is the China A. (*A. sinensis*), a summer annual, of which many varieties are in cultivation, and new ones are continually introduced. It was brought from China in the earlier part of the 18th c. The varieties exhibit great diversities of form and color. The plant delights in a rich free soil. In the n. parts of the United States, the seed is usually sown in April in a hot-bed, or in pots under a frame, and the young asters are planted out in the open air in May. They flower from July to the end of autumn.—*A. argophyllus*, or *Haxtonia argophylla*, is a shrub, native of Van Diemen's Land, smelling strongly of musk. There are no less than 50 species of wild A. in e. and central United States, giving great beauty to our autumn foregrounds.

ASTERABAD': see ASTRABAD.

ASTERACANTHUS, n. *ās'tēr-ă-kăn'thŭs* [Gr. *aster*, a star; *akantha*, a thorn or spine]: a genus of fossil fin spines of fishes, often of large size, having their surfaces richly ornamented with star-like tubercles.

ASTERIA, n. *ās-tēr'ri-ă*, or ASTERITE, n. *ās'tēr-īt* [Gr. *aster*, a star]: a variety of corundum or star sapphire, which, when cut in a certain way, shows a bright opalescent star of six rays. ASTERIATED, a. *ās-tēr'ri ā tēd*, radiated; star like.

ASTE'RIAS and ASTERI'ADÆ: see STARFISH.

ASTERISK, n. *ās'tēr-isk* [Gr. *asteriskos*, a little star—from *aster*, a star]: a sign or symbol (*), used in writing and printing, either as a reference to a note at the bottom or on the margin of the page. The obelisk (q.v.), or dagger (†), and many other marks, are similarly employed; but when there are several references on the same page, it is now common to use the numerals 1, 2, 3, etc. The A. and other similar signs may have any arbitrary meaning assigned to them at the will of the writer, an explanation being previously given of what the signification is to be. Omission of words may be marked with two or more stars. The Greek grammarians, or critics, used the A. to mark a passage that had been unjustly suspected, but was to be held as genuine, or a passage in any way remarkable; the obelisk marked an interpolated or an objectionable word or passage.

ASTERN, ad. *ă-stēr'n'* [AS. *a*, on or at, and *stern*, behind]: at the stern; in or at the hinder part of a ship; behind. To GO ASTERN, to move backwards as a vessel, as from the action of currents or the wind. To BACK ASTERN, to move backwards.

ASTEROID, n. *ās'tēr-oyd* [Gr. *aster*, a star; *oidos*, likeness]: one of the minor planets. See PLANETOIDS. AS'TEROI'DAL, a. pertaining to the small planets. ASTERISM, n. *ās'tēr-izm*, a cluster of stars; a constellation.

ASTEROIDEA—ASTHMA.

ASTEROIDEA, n. plu. *ās'tēr-oy'dē-ă* [Gr. *aster*, a star; *eidos*, resemblance]: the order of animals of which the common five rayed star-fish is taken as the type; an order of *Echinoderms* having one opening to the alimentary canal, and a rayed or star-like structure. **AS'TEROID**, n. *-oyd*, one of the asteroidea: **ADJ.** of or pertaining to; rayed; star-like.

ASTEROLEPIS, n. *ās'tēr-ō-lē'pīs* or *-ōl'* [Gr. *aster*, a star; *lepis*, a scale]: a gigantic ganoid fossil fish of the old red sandstone.

ASTEROPHYLLITES, n. plu. *ās'tēr-ō-fīl'īts* [Gr. *aster*, a star; *phyllon*, a leaf]: genus of fossil plants abundant in the coal-measures, and called sometimes Star-leaf, from their star-like whorls of linear leaves. Their affinity is not yet positively decided, but they are usually considered the branches of the *Calamites* or *Calamodendron*.

ASTHENIC, a. *ās-thēn'īk* [Gr. *a*, without; *sthenos*, strength]: weak; debilitated. **ASTHENIA**, n. *ās-the-nī-ă*, in *med.*, want or loss of strength; debility. **AS'THENOL'OGY**, n. *-ōl'ō-jī* [Gr. *logos*, discourse]: a discourse on diseases connected with debility.

ASTHMA, n. *āst'mă* [Gr. *asthma*—from *ăō*, I blow, I breathe]: a disease of the organs of breathing attended with cough and difficulty of breathing. **ASTHMATIC**, a. *āst-măt'īk*, or **ASTHMAT'ICAL**, a. *-ī-kăl*, troubled with difficulty of breathing.

A. is characterized by the breathing, previously natural, becoming difficult, accompanied by wheezing and a distressing sense of tightness in the chest. **A.** generally appears at first after some inflammatory affection of the respiratory mucous membrane, and more especially in those who have led dissipated lives. In others, it is clearly hereditary, and frequently affects several members of the same family. **A.** may be habitual, or may occur in spasms, generally preceded by some premonitory symptoms, as in some by great drowsiness; in others, by extreme wakefulness and unusual mental activity and buoyancy of spirits; and a physician reports one case in which an attack of ophthalmia occurred.

The spasms may occur at any hour; but in nineteen out of twenty cases they waken the patient from sleep between three and four in the morning. The horizontal position facilitating the flow of blood to the right side of the heart, and therefore to the lungs, the disadvantage at which the muscles of respiration are placed, and the greater readiness with which sources of irritation act during sleep, explain this fact.

Persons subject to **A.** scarcely dare fall asleep after any imprudence in diet; if they continue awake till their supper is fairly digested, and the stomach empty, they may go to sleep fearlessly, and have a good night's rest. The asthmatic paroxysm is thus described by Dr. Hyde Salter, a late authority in England on this common but terrible disease: 'The patient goes to bed and sleeps two or three

ASTI—ASTIGMATISM.

hours, becomes distressed in his breathing, and begins to wheeze, so as to awaken those in adjoining rooms. He awakes, changes his position, falls asleep again and again, and the miserable fight between A. and sleep may go on, till the increased suffering does not allow the patient longer to forget himself for a moment; he becomes wide awake, sits up in bed, throws himself forward, plants his elbows on his knees, and with fixed head and elevated shoulders, labors for breath like a dying man.'

If the spasm is protracted, the oxygenation of his blood is imperfectly performed, owing to the scanty supply of air, and his extremities get cold and blue, but at the same time the violent muscular efforts at respiration cover him with sweat. The pulse is always small. The muscles of the back and neck attached to the ribs act as extraordinary muscles of respiration. The chest enlarges during the paroxysm, but in it there is almost perfect stagnation of air. The respiratory tubes affected are very small, and the parts at which they are so constricted are constantly shifting.

The remedies commended for A. are numerous, but not to be depended on. They consist in paying attention to the digestive system, and in anti-spasmodics, taken either internally or by inhalation.

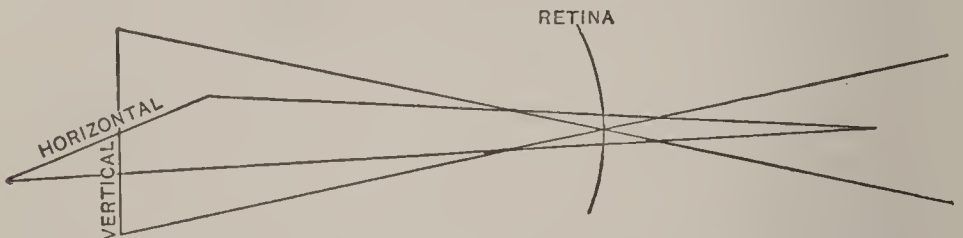
ASTI, *ās'tē* (*Asta Pompeia*): city of Piedmont, govt. of Alessandria, on the left bank of the Tanaro, on the railway from Turin to Genoa, $26\frac{1}{2}$ m. e.s.e. of Turin. It is a large town, with walls considerably dilapidated, and the streets generally very narrow and irregular. It is the seat of a bishop, and has a court of justice and a royal college. There is carried on a considerable trade in silk and woollen fabrics, leather, and hats, as well as in wines and agricultural produce. A. is a town of high antiquity, having been famous for its pottery before its capture by the Gauls, B.C. 400. On the occasion of its being again taken and destroyed in an irruption of the Gauls, it was rebuilt by Pompey, and received the name of *Asta Pompeia*. In the middle ages, A. was one of the most powerful republics of Upper Italy. It was captured and burnt by the emperor Frederick I., 1155; and after a series of vicissitudes, it came into the possession of the Visconti of Naples, by whom it was ceded to the French, in whose hands it remained till the middle of the 16th c., when it came into the possession of the Dukes of Savoy, as it still remains. Alfieri was born here, 1749. Pop. about 34,000.

The district of Asti, one of the six subdivisions of the govt. of Alessandria, is bounded on the w. and n. by the province of Turin, s. by Alba, s.e. by Alessandria Proper and n.e. by the province of Casale. The surface is hilly and picturesque. The soil rests upon limestone abounding in fossils, and is fertile, producing corn, fruit, and wine. It is celebrated for a fine white wine resembling champagne, called *vino d'Asti*. Silk is one of its most important products.

ASTIGMATISM, n. *a-stīa'ma-tīzm* [Gr. *a*, without;

ASTIGMATISM.

stigmatizō, to prick, to puncture]: condition of the eye in which parallel rays of light are not brought to a focus by the media. It is a frequent cause of defective eyesight. A. in the vast majority of cases is due to irregularity in the curvature of the cornea; though it may arise from imperfections in the lens, irregular contraction of the ciliary muscle, or possibly defect in the retina. In the normal eye, parallel rays are brought to a focus accurately on the retina. In the myopic and hypermetropic eyes, rays are brought to a focus, though not on the retina; but in the astigmatic eye, rays of light never come to a focus either on the retina or elsewhere. According to the laws of refraction, the smaller the curve of the refracting body the shorter the course of the traversing ray. If, therefore, in one meridian of the cornea, the curvature is smaller than that at right angles to it, it is evident that rays of light traversing the smaller curve will be brought to a focus sooner than the rays traversing the greater curve. Suppose a case in which the vertical meridian brings rays accurately to a focus on the retina, but in which rays passing through the horizontal meridian are brought to a focus behind the retina, as shown in the accompanying diagram (in which Vertical denotes rays striking the cornea from a meridian standing as it were upright before the eye, while Horizontal denotes rays striking the cornea from a meridian extending from side to side before it).



It will be seen that at no one place is an actual focus obtained, both of the rays from the horizontal meridian and of the rays from the vertical meridian—that when the latter are focused on the retina, the former have not yet reached a point; and on the other hand, when the former rays have reached a focus the latter rays are far divergent, having come to a point and crossed at the retina. This condition may exist in various forms: (*a*) simple hypermetropic A., in which the rays in one diameter fall on the retina, but rays at right angles fall behind: (*b*) simple myopic A., the exact reverse of the preceding, rays in one diameter being focused on the retina and the rays at right angles being brought to a focus in front of the retina: (*c*) compound hypermetropic A., in which all rays fall behind the retina, but some further back than others: (*d*) compound myopic A., in which all rays fall in front of the retina, but some further in front than those at right angles to them: (*e*) mixed A., a form in which rays in one meridian fall behind the retina, and in the meridian at right angles the rays are focused in front of the retina, a combination of hypermetropia and myopia in the same eye. The effect of A. is to blur outlines of objects, rendering them much less distinct and clear cut. A. is also a frequent source of headache, and of many of the nervous phenomena of civilized life. Many sufferers have been permanently relieved of their headaches by the accurate

ASTIR—ASTOR.

fitting of a pair of glasses which corrected their astigmatism. —A. is corrected by means of cylindrical glasses, either alone or in combination with spherical lenses which unequally refract light, bringing parallel rays to different foci to suit each case. —For fuller information, see Noyes, *Diseases of the Eye*; Soelberg Wells, *On Diseases of the Eye*; Fox and Gould, *Diseases of the Eye*; Brudenel Carter *On the Eye*.

ASTIR, ad. *ă-stēr'* [AS. *a*, on, and *stir*]: on the move; active.

ASTOMATOUS, a. *ă-stöm'ă-tūs* [Gr. *a*, without; *stom'ata*, mouths]: mouthless; without a true mouth or aperture; also spelt ASTOMOUS, *ăs'tō-mūs*.

AS'TON, LUISE: b. abt. 1820, near Halberstadt, Prussia: German authoress of some note, but known principally for her zeal for the 'rights of women,' accompanied with eccentricities of conduct which brought her into collision with the police. During the Slesvig-Holstein war, however, she showed heroism and self-sacrificing devotion as a hospital nurse. She has written various books, of no great note.

ASTONE, v. *ăs-tōn'*, or ASTONY, v. *ăs-tōn'ī* [see ASTONISH]: in *OE.*, to confound with fear and amazement; to terrify; to astonish. ASTONIED, pp. *ăs-tōn'īd*, for *astonished*, a word occasionally occurring in Scripture.

ASTONISH, v. *ăs-tōn'ish* [OF. *estonner*, to amaze—from L. *attonārē*, to thunder at, to stress—from L. *ad*, to; *tono*, I thunder: AS. *a*, intensive, *stunian*, to make stupid with noise]: to strike dumb as with fear or wonder; to fill with sudden fear and wonder; to amaze; to confound with surprise. ASTON'ISHING, imp. ASTON'ISHED, pp. *-īst*. ASTON'ISHINGLY, ad. *-lī*. ASTON'ISHMENT, n. confusion of mind from fear or wonder; amazement; the cause of amazement. —SYN. of 'astonish': to surprise; amaze; astound; overwhelm.

ASTOR, *ăs'tor*, JOHN JACOB: 1763–1848; b. in a village near Heidelberg, Germany. After spending some years in London, he came to America, 1783, and soon invested his small capital in furs. By economy and industry, he so increased his means that after six years he had acquired \$200,000. He became the founder of the American Fur Company, and although the increasing influence of the English Fur Companies in N. America was unfavorable to his plans, he ventured to fit out two expeditions to the Oregon territory—one by land, and one by sea—the purpose of which was to open a regular commercial intercourse with the natives. After many mishaps, his object was achieved in 1811, and the fur-trading station of Astoria (q.v.) was established; but the war of 1812 stopped its prosperity for a time. From this period A.'s commercial connections extended over the world, and his ships were found in every sea. At his death he left property amounting to \$30,000,000. He left a legacy of \$400,000 for the establishment of a public library in New York. See ASTOR LIBRARY. (See Washington Irving's *Astoria*.)—His wealth was mainly inherited

ASTORGA—ASTORIA.

by his son, WILLIAM B., who continued to augment it till his death in 1875, when he is said to have left more than \$50,000,000. He added \$450,000 to his father's bequest for a public library. He was known as the 'landlord of New York' from the extent of his property in that city.

ASTOR, WILLIAM WALDORF: great grandson of John Jacob A. the elder, and son of John Jacob A. 2d: b. New York, 1848, Mar. 31. He was educated by private tutors in the United States and Europe; graduated at the law school of Columbia College 1875; was elected a member of the state assembly 1877 as a republican, and the state senate 1879, serving on the committees on militia, cities, judiciary, commerce and navigation, and public expenditures; was defeated for member of congress 1880; was appointed U. S. minister to Italy, succeeding the late George P. Marsh, 1882; and held the office till 1885. He practiced his profession but a short time, and excepting his public duties has applied himself to the care of the vast landed estate of his family. In his leisure he has published two Italian romances, *Valentino* (New York, 1886), and *Sforza: a Story of Milan* (889). He settled in London 1890, and was naturalized a citizen of Great Britain 1899. He inherited one of the vastest estates of modern times.

ASTORGA, *ás-tor'gâ*, EMANUELE D': b. 1680, in Sicily: musician. His father, a baron of Sicily, in the contest respecting the annexation of the island to Spain, was delivered to the enemy by his own mercenary soldiers, and was put to death 1701. Through the interest of the Spanish Princess Ursini, A. was educated in a monastery at Astorga in Leon. Here he made great progress in music, and afterward was at the court of the Duke of Parma, and of the Emperor Leopold. His best work is the *Stabat Mater*, a masterly composition, of which the original score is preserved in Oxford.

ASTORIA, *ás-tō'ri-a*: city, cap. of Clatsop co., Or.; at the junction of the Young's and the Columbia rivers, near the mouth of the Columbia; 98 m. n.w. of Portland, 555 m. n. of San Francisco. It was founded by John Jacob Astor, 1811, as a fur-trading station (see Washington Irving's *Astoria*). It has a harbor affording unlimited anchorage; defended by Fort Stevens on the s. side of the entrance to the Columbia, 6 m. below the city, and by Fort Canby on the n. side, 12 m. below; and undergoing improvement by the federal govt. on an appropriation of \$1,300,000. The business portion is built entirely on piles over tide-water, on the s. bank of the river, here 4 m. wide, and the residence streets rise in parallel terraces on the face of a lofty hill. The city is a port of entry, and has more than 3 m. of excellent wharfage front. Water is brought 11 m. to a reservoir holding 3,000,000 gallons, giving a pressure of 240 ft. at tide-water; the water-works system cost \$100,000. The city has electric light (cost \$75,000) and gas plants. It contains public high and graded schools, 6 church edifices (Bapt., Congl., Meth. Episc., Presb., Prot. Episc.,

ASTOR LIBRARY—ASTOUND.

and Rom. Cath.), Odd Fellows' temple, Rom. Cath. hospital, 1 national bank (cap. \$50,000), 1 private bank, and 2 daily and 4 weekly newspapers. Salmon fishing and canning are principal industries: there are about 40 canneries in the city and suburbs; average value of the season's salmon catch, \$2,500,000. Lumbering also is an important industry, about 400,000 ft. per day of logs being 'driven.' The city ships largely to San Francisco and Liverpool. Pop. (1900) 8,381; fishing season 10,000.

ASTOR LIBRARY: a chartered institution, given to the city of New York by the will of John Jacob Astor, who died, 1848, leaving a legacy of \$400,000 for the purpose. From this amount the original building of the library in Lafayette Place was erected, and opened to the public, 1854, Jan. 1. Two years later, William B. Astor, eldest son of the former, gave land adjoining, on which was erected a second building, of the same dimensions as the first, and to these two has since been added a third similar structure. The entire edifice is connected, and forms a frontage of about 200 ft., with a depth of 105 ft. and a height of 70 ft. William B. Astor added to the original bequest about \$250,000 during his life, and, by a codicil to his will, \$200,000 additional. His son, John Jacob A. 2d (1822, June 10—1890, Feb. 22), bequeathed the trustees \$400,000, directing that the net income should be expended from time to time in the purchase of books to be added to the library and for no other purpose; and a further sum of \$50,000 as a permanent fund whose income should be used only for paying the trustees the sum of \$10 each for attending each regular meeting of the corporation. These bequests brought the entire donations of the Astor family to the library in land, books, and money to nearly \$1,500,000. The first board of trustees comprised Washington Irving, William B. Astor, D. Lord, Dr. J. G. King, Dr. J. G. Cogswell, Fitz Greene Halleck, Samuel B. Ruggles, S. Ward, Charles Astor Bristed, and the mayor of New York, *ex officio*. Dr. Cogswell collected all the books for the original building—known as the South Library—and made the entire catalogue. He held the office of supt. till 1861, when Frederick Schraeder succeeded him. Dr. E. R. Straznicky was supt. 1871–73, James Carson Brevoort 1873–75, and Robbins Little has held the office since 1878. The A. L. is a public library of reference, no books being permitted to be removed from the premises. Any person over 14 years of age is entitled to the privilege of consulting the various works of a general character. For special books, unique productions, rare Americana, and the rich collection of publications that cannot now be duplicated in Europe or America, special permission must be obtained. The library is closed on Sundays, public holidays, and during the month of Aug. for cleaning. In 1895 the A. L. was consolidated with the Lenox Library and the Tilden Trust under the title of the New York Public Library (*q. v.*).

ASTOUND, *v.* *ās townd'* [see **ASTONISH**]: to strike dumb with amazement. **ASTOUND'ING**, *imp.* **ASTOUND'ED**, *pp.*

ASTRABAD—ASTRAGALEÆ.

ASTRABAD, *ās'tra-bād'*: town in the n. of Persia, cap. of the province of A.; at the foot of the n. slope of the Elbruz Mts., on a small river which runs into A. Bay, at the s.e. extremity of the Caspian. It is 20 m. from the Caspian Sea; lat. 36° 50' n., long. 54° 31' e. It was long the residence of the Kajar princes from whom the present shah of Persia is descended; but on account of its situation in a remote corner of the kingdom, it was not made the metropolis, and it has sunk in importance. It is still inclosed by a dry ditch and mud-wall, 3 m. in circumference, but its great towers have disappeared. Trade has increased since the establishment of a Russian consulate. The causeway constructed by Shah Abbas is kept in good repair, and connects A. with Khorassan, Afghanistan, etc. The town is very unhealthful during the summer rains. Pop. 6,000–8,000.

ASTRADDLE, ad. *ă-străd'dī* [AS. *a*, on, and *straddle*]: with the legs on opposite sides of a thing.

ASTRÆA, n. *ās-trē'a* [Gr. *aster*, a star]: the goddess of justice; one of the minor planets. **ASTRÆIDÆ**, n. plu. *ās-trē'ī-dē*, the family of star-corals, so called from the great development of their radiating septa. **ASTRÆ'AN**, a. pertaining to Astræa; favored by her presence.

ASTRÆA, *ās-trē'a*: daughter of Zeus and Themis, or of Astræus and Aurora, was the goddess of justice, the last of all the goddesses who left the earth when the golden age had passed away and men began to forge weapons and perpetrate acts of violence. She took her place in heaven as the constellation Virgo in the zodiac.—Greek art usually represented her with a pair of balances in her hand, and a crown of stars on her head.—A. is also the name of one of the Planetoids (q.v.).

ASTRÆ'A, **ASTRÆIDÆ**: see CORAL: MADREPORE.

ASTRAGAL, n. *ās'tră-găl* [L. *astrăg'ălus*; Gr. *astrag'alos*, the upper joint of the neck, the ankle-joint]: a small circular or semicircular bead; the ring-like molding round the top and bottom of the column of a pillar; the beaded zinc bars used by zinc-workers in making diamond and ornamental window-frames. **ASTRAGALUS**, n. *ās-trăg'ă-lūs*, in *anat*, a bone of the foot, which, by a convex upper surface and smooth sides, forms, with the leg-bones, the hinge of the ankle-joint. Its lower surface is concave, and rests on the *os calcis*, or heel-bone, to which it is attached by a strong ligament. In front, it has a round head, which rests in the concavity of the scaphoid, another bone of the tarsus, and upon an elastic ligament, its pressure upon which gives in a great measure the necessary elasticity to the foot: it is at this joint that inversion and eversion of the foot take place. It is evident that the A. is a bone of great importance to the member, as it supports the weight of the body in standing, and enters into most of the movements of the foot. It is occasionally displaced, usually in front of the outer ankle.

ASTRAGAL'Æ: see ASTRAGALUS.

ASTRAGALOMANCY—ASTRAGALUS.

ASTRAGALOMANCY, *äs-träg'a-lo-män'si* [Gr. *astragalos*, dice; *manteia*, divination]: pretended divination performed by throwing down small dice with marks corresponding to letters of the alphabet, and observing what words they formed. It was practiced in the temple of Hercules in Achaia.

ASTRAGALUS, *äs-träg'ä-lüs*: genus of plants of the nat. ord. *Leguminosæ*, sub-order *Papilionaceæ*. The pod is



Astragalus Boëticus.

more or less perfectly 2-celled. The leaves are pinnate, with a terminal leaflet. The species are numerous, shrubby, and often spiny, or unarmed and herbaceous. A number of the shrubby species yield the substance called Tragacanth (q.v.), or Gum Tragacanth.—*A. Boëticus* is cultivated in Hungary, Germany, and other parts of Europe, for its seeds, which are roasted, ground, and used as a substitute for coffee, or mixed with it to improve its flavor.—The Sweet Milk-vetch, or Wild Licorice (*A. glycyphyllos*), a native of Britain and other parts of Europe, perennial, with long and very thick roots, which penetrate deep into the soil, and almost prostrate stems, 3 feet in length, is occasionally cultivated for food of cattle. In the w. and s.w. United States there are various species, including *A. caryocarpus*, the Ground Plum; and *A. Mollissimus*, or 'loco-weed,' which is supposed to have caused the death of many thousand horses and cattle. In Vermont and n. occur 2 highland species.

ASTRAKANITE—ASTRAL.

ASTRAKANITE, *ás'tra-kan-īt* [Gr. *astrakanit*—from Astrakhan (q.v.)]: mineral with whitish crystals; same as blædite.

ASTRAKHAN, *ás-trá-kán'*: originally a province of the Mogul empire, but united with the Russian empire, 1554. At present A. forms one of the s.e. governments of Russia in Europe; bounded on the s. by the Caspian Sea and the Caucasus; on the w. by the country of the Don Cossacks; on the n. by the govt. of Saratov; and on the e. by Orenburg: 91,285 sq. m. The province of A. is almost entirely a barren waste, the only fertile portions being the banks of the Volga, which divides the province into two equal parts. Salt is procured from the marshes of the steppes, considerable numbers of cattle are reared, and the annual value of the sturgeon-fishing in the Volga is as much as 2,500,000 roubles (about \$2,000,000). The climate varies from 70° F. in summer to 13° in winter. Pop. (1897) 994,775, composed of Russian, Tartar, and a geeat diversity of elments.

ASTRAKHAN': chief town of the govt. of A.; on an island of the Volga, near the Caspian Sea; lat. 46° 21' n., long. 48° 4' e. It is the seat of a Greek abp. and an Armenian bp.; has 37 Greek, 2 Rom. Cath, 1 Prot., and 2 Armenian churches; 15 mosques, an Indian temple, a gymnasium, a seminary for priests, a botanical garden, and many manufactories. The houses are mostly of wood, irregularly built. The fisheries in the Volga supply occupation to many inhabitants of A. and its neighborhood. The principal exports are leather, linen, and woolen goods, salted sturgeon, caviar, and isinglass. Imports are chiefly gold-embroidered silken goods from Persia, silk stuffs, woolen goods, rice, rhubarb, raw silk, drugs, etc. From July to Oct. the neighborhood of A. is frequently visited by swarms of locusts. Pop. (1887) 73,710; (1897) 112,880.

ASTRAKHAN: a fine curly kind of fur on the pelts of young lambs, the product of a variety of sheep found in Bokhara, Persia, and Syria.

ASTRAL, *ás'trāl* [Gr. *aster*, a star]: belonging to the stars; starry. ASTRAL BODY, in Theosophy (q.v.), a sort of spiritual body detachable from man's material body during life, and subsisting after the death of the material body. ASTRAL LAMP, a kind of argand lamp casting an uninterrupted light from under a concave glass. ASTRAL SPIRITS, spirits which, in some eastern religions, were supposed to animate the heavenly bodies. The star and fire worship of the eastern religions rested on the doctrine that every heavenly body is animated by a pervading spirit, as it were, a soul; and this doctrine passed into the religio-physical theories of the Greeks and Jews, and even into the Christian world. In the demonology or spirit-systems of Christendom in the middle ages, Astral Spirits are conceived of sometimes as fallen angels, sometimes as souls of departed men, sometimes as spirits originating in fire, and hovering between heaven, earth, and hell. Their intercourse with men and their influence were variously represented. In the 15th c., the demonologists, or special students of this subject, systematized the strange fancies

ASTRANTIA—ASTROCARYUM.

of that wild period; and A. S. were made to occupy the first rank among evil or demoniacal spirits. Paracelsus, however, and others attributed to every human being an astral spirit, or sidereal element, in which the human soul, or spirit proper, is thought to inhere, and which lives for a time after the person dies. ASTRAL LAMP, lamp similar to an Argand lamp (q.v.).

ASTRANTIA, *as-trăn'shĭ-a* [Gr. *astron*, a star; *anti*, here implying comparison with]: Masterwort; genus of plants of order *Umbelliferæ*. Masterwort misapplied to cow-parsnip.

ASTRAPÆA, *ăs'tra-pē-a* [Gr. *astrapaĩos*, pertaining to lightning]: genus of plants belonging to the order *Sterculiaceæ*, tribe *Dombeyæ*. It has large heads of flowers so splendid in color that they suggested the generic name.

ASTRAY, ad. *ă-stră'* [AS. *a*, on, and *stray*]: out of the right way or proper place.

ASTRICT, v. *ă-strĭkt'* [L. *astrictus*, drawn tight—from *ad*, to; *stringo*, I bind]: to bind firmly; to contract. ASTRIC-TION, n. *ă-strĭk'shŭn*, the act of binding close or contracting; the contraction of parts by the application of medicaments. ASTRICTIVE, a. *ă-strĭk'tiv*, binding; also ASTRIC-TORY, a. *ă-strĭk'tēr-ĭ*.

ASTRIDE, ad. *ă-strĭd'* [AS. *a*, on, and *stride*]: with the legs apart.

ASTRIFEROUS, a. *as-trĭf'ēr-ŭs* [L. *astrum*, a star; *fero*, I bear]: bearing stars; starry. ASTRIGEROUS, *as-trĭg'ēr-ŭs*, carrying stars.

ASTRINGE, v. *ă-strĭnj'* [L. *astringĕrĕ*, to bind or tie tight together—from *ad*, to; *stringo*, I bind fast]: to bind tightly together; to contract by pressing together. ASTRING'-ING, imp. ASTRINGED', pp. *-strĭnjd'*. ASTRINGENT, n. *ă-strĭn'jĕnt* [L. *astrin'gens* or *astringen'tem*, binding or tying fast]: that which contracts or draws together muscular fibre; the opposite of laxative; the principle in bark that tans hides for leather: ADJ. binding. ASTRIN'-GENCY, n. *-jĕn-sĭ*, the power of contracting parts, as the soft solids of the body. ASTRIN'GENTLY, ad. *-lĭ*.

ASTRIN'GENTS: medicines used for contracting the animal fibres and canals, so as to check fluxes, hemorrhage, and diarrhea. The drugs most commonly used as A. are alum, catechu, oak-galls, rhatany-root, etc. Many of the vegetable A. owe that property, in whole or in great part, to tannin. A severe degree of cold is a powerful as-tringent.

ASTRIPOTENT, a. *ăs-trĭp'o-tĕnt* [L. *astrum*, a star; *potens*, powerful]: ruling the stars.

ASTROCARYUM, *ăs-trō-kă'rĭ-ŭm* [from the Gr. *astron*, a star, and *karyon*, a nut]: a genus of Palms, of which about sixteen species are known, natives of tropical America, remarkable for the abundance of acute and formidable spines—in some cases, a foot long—with which almost every part—stem, leaves, spathe, and fruit-stalk—is armed. They have beautiful pinnated leaves; some of them are lofty, others of very moderate height, as 8-15

ASTROCARYUM.

ft., while some are almost altogether stemless. The fruit of some species is eatable—a juicy pulp covering a stony seed—as the fruit of the MURUMURÚ palm (*A. Murumuru*), the pulp of which is said to resemble a melon in flavor, has a sort of musky odor, and is highly esteemed. It is 8–12 ft. high, abundant about Pará and elsewhere on the Amazon. Cattle roam the forests in quest of its fruit, and swine fatten on the seed, which they crush with their teeth, although to break it requires a smart blow of a



Tucum Palm (*A. vulgare*).

hammer, and in hardness it almost resembles vegetable ivory. Another edible fruit is that of the TUCUMA' palm (*A. Tucuma*), abundant in the same regions. These fruits are about an inch long, the Murumurú ovate, the Tucumá almost globular. The Tucumá palm is 30–40 ft. high, the stem encircled with narrow rings of black spines, which are disposed with beautiful regularity. The TUCUM palm (*A. vulgare*), a species quite distinct from the Tucumá, and more lofty, is of great importance to the Indians, and in places where it is not indigenous, is cultivated with care on account of the epidermis of its unopened leaves, of which they make cordage, useful for bow-strings, fishing-nets, etc. The fibre is at once fine, strong, and durable, and may perhaps become important as an article of commerce. Beautiful hammocks are made of tucum thread. Martius, in his great work on Palms

ASTROGNOSY—ASTROLABE.

(*Palm Trees of the Amazon*, Lond. 1853), has, by mistake, represented the Tucumá instead of the Tucúm palm as yielding this fibre. The fibre is obtained by cutting down the terminal bud or column of unopened leaves which rises



Stemless Palm (*A. acaule*).

b, spadix, with spathe forming a hood over fruit; *c*, fruit, about one-fifth natural size.

from the centre of the crown of foliage. The tender leaflets are then carefully stripped of their epidermis, in pale, ribbon-like pellicles which shrivel up almost to a thread. These are tied in bundles, and dried, and afterwards twisted into thread, or made into thicker cords, by mere rolling and manipulation.

ASTROGNOSY, *n.* *as trōg'nō sĭ* [Gr. *astron*, a star; *gnōsis*, inquiry, knowledge]: knowledge of the stars.

ASTROGRAPHY, *n.* *ās-trōg'ră-fĭ* [Gr. *aster* or *astron*, a star; *grapho*, I describe]: a description of the stars.

ASTROID, *n.* *ās-troyd'* [Gr. *astron*, a star; *eidos*, form]: in *her.*, a mullet.

ASTROITE, *n.* *ās-trō'it* [Gr. *astron*, star; *lithos*, stone]. any star stone, i.e., stone of a radiate structure or superficially radiated; specially, an ancient gem, called by Pliny *asteria*. Some have thought this the mineral cat's-eye, others amianthus or asbestos inclosed in quartz. Phillips and Dana regard it as a variety of the sapphire—that sometimes called the *asteriated sapphire*.

ASTROLABE, *n.* *ās'trō-lāb* [Gr. *astron*, a star; *labein*, to take]: name given by the Greeks to any circular instrument for observing the stars. Circular rings, arranged as in the armillary sphere (see under **ARMILLA**), were used for this purpose. A projection of the sphere upon a plane, with a graduated rim and sight for taking altitudes, was known as an *A.* in the palmy days of astrology, and was the badge of the astrologer. The *A.* has been superseded by the instruments of modern astronomy. See **QUADRANT**: **SEXTANT**.

ASTROLATRY—ASTROLOGY.

ASTROLATRY, n. *ās-trōl'ă-trĭ* [Gr. *astron*, a star; *latrei'a*, worship]: the worship of celestial bodies; star-worship.

ASTROLITHOLOGY, *ās-tro-lĭ-thōl'o-jĭ* [Gr. *astron*, a star; *lithos*, a stone; *logos*, a discourse]: the science which treats of meteorites or aerolites.

ASTROLOGY, n. *ās-trōl'ō-jĭ* [Gr. *astron*, a star; *logos*, discourse]: a science that pretends to foretell events by observing the stars. **ASTROL'OGER**, n. *-jer*, a person who pretends to foretell events by the stars. **ASTROLOGICAL**, a. *ās'trō-lōj'ĭ-kāl*, or **ASTROLOGIC**, *-ĭk*, pertaining to. **ASTROLOG'ICALLY**, ad. *-ĭ-kāl-ĭ*. **ASTROLOGIZE**, v. *ās-trōl'ō-jĭz*, to practice astrology. **ASTROL'OGI'ZING**, imp. **ASTROL'OGIZED'**, pp. *-jĭzd'*.

ASTROL'OGY: originally nearly the same as *astronomy*, 'the knowledge of the stars'; at length restricted to the science of predicting future events, especially the fortunes of men, from the positions of the heavenly bodies. This was considered the higher, the real science; while the mere knowledge of the stars themselves, their places and motions (*astronomy*), was, till recently, cultivated mostly with a view to (judicial) astrology. A. is one of the most ancient forms of superstition; it prevailed among the nations of the East (Egyptians, Chaldæans, Hindus, Chinese) at the very dawn of history. The Jews became much addicted to it after the captivity. It spread into the West and to Rome at about the Christian era. Astrologers were an important class at Rome, where they were called Chaldæans and Mathematicians; and though often banished by the senate and emperors under pain of death, and otherwise persecuted, they held their ground. The Roman poet Manilius, author of an astronomical poem still extant, was addicted to A.; and even Ptolemy the astronomer did not escape the infection, which in his time had become universal. A., which accords well with the predestinarian doctrines of Mohammedanism, was cultivated with great ardor by the Arabs from the 7th to the 13th c. Some of the early Christian fathers argued against the doctrines of A., others received them in a modified form. In its public capacity the Roman Church several times condemned the system; but many zealous Rom. Catholics have cultivated it. Cardinal d'Ailly, 'the Eagle of the doctors of France,' (d. 1420), is said to have calculated the horoscope of Jesus Christ, and maintained that the deluge might have been predicted by A. For centuries the most learned men continued devoted to this delusive science; Regiomontanus, the famous mathematician Cardan, even Tycho Brahé and Kepler could not shake off the fascination. Kepler saw the weakness of A. as a science, but could not bring himself to deny a certain connection between the positions ('constellations') of the planets and the qualities of those born under them. The Copernican system gave the death-blow to A. When the earth itself was found to be only one of the planets, it seemed absurd that all the others should be occupied in influencing it. The argument has

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really little force, but it produced the effect. Belief in A. is not now ostensibly professed in any Christian country, though a few solitary advocates have from time to time appeared, as J. M. Pfaff in Germany, *Astrologie* (Bamb. 1816); and ignorant impostors use it to get money from the superstitious. But it still holds sway in the East, and among Mohammedans everywhere. Even in Europe the craving of the ignorant for divination is still gratified by the publication of multitudes of almanacs containing astrological predictions, though the writers no longer believe in them.

Many passages of old writers are unintelligible without some knowledge of astrological terms, numbers of which have taken root in the language. In the technical rules by which human destiny was foreseen, the heavenly *houses* played an important part. Astrologers were by no means at one as to the way of laying out those houses. A very general way was to draw great circles through the n. and s. points of the horizon, as meridians pass through the poles, dividing the heavens, visible and invisible, into twelve equal parts—six above the horizon, and six below. These were the twelve houses, and were numbered onward, beginning with that which lay in the e. immediately below the horizon. The first was called the house of life; the second, of fortune, or riches; the third, of brethren; the fourth, of relations; the fifth, of children; the sixth, of health; the seventh, of marriage; the eighth, of death; or the upper portal; the ninth, of religion; the tenth, of dignities; the eleventh, of friends and benefactors; the twelfth, of enemies, or of captivity. The position of the twelve houses for a given time and place—the instant of an individual's birth, for instance—was a *theme*. To construct such a plan was to *cast* the person's nativity. The houses had different powers, the strongest being the first; as it contained the part of the heavens about to rise, it was called the *ascendant*, and the point of the ecliptic cut by its upper boundary was the *horoscope*. Each house had one of the heavenly bodies as its *lord*, who was strongest in his own house.

ASTROMETEOROLOGY, *ās-trō-mē-tē-or-ōl'o-jī* [Gr. *astron*, a star; *meteōrologia*—from *meteōros*, meteor; *logos*, discourse]: the investigation of the influence exerted by sun, moon, and stars upon the weather. The sun exerts transcendent influence; but there is no ground for the common notion that changes of the moon effect changes in the weather; and no such influence is traceable to the stars.

ASTROMETER, n. *ās-trōm'ē-tēr* [Gr. *astron*, a star; *metron*, a measure]: an instrument devised for comparing the brightness of stars. ASTROM'ETRY, n. *-ēt-rī*, measurement and numerical expression of the apparent magnitude of the fixed stars.

ASTRONOMY.

ASTRONOMY, n. *ās-trōn'ō-mī* [Gr. *astron*, a star; *nomos*, a law]: the science that treats of everything connected with the heavenly bodies. ASTRONOMER, n. *ās-trōn'ō-mēr*, one given to the study of the heavenly bodies. ASTRONOMIC, a. *ās'trō nōm'ik*, or AS'TRONOM'ICAL, a. *-nōm i-kāl*, pertaining to. AS'TRONOM'ICALLY, ad. *-lī*. ASTRONOMIZE, v. *ās-trōn'ō-mīz*, to assume the habits and study of an astronomer. ASTRON'OMI'ZING, imp. ASTRON'OMIZED', pp. *-mīzd'*.

ASTRON'OMY: science of the heavenly bodies; properly divided under three heads. 1. *Geometrical or Mathematical A.*, including the exact determination of the numerical and geometrical elements of the heavenly bodies—that is, their distances, shapes, magnitudes, the figures that they describe in their motions, etc. 2. *Physical A.*, or the nature of the powers or forces that carry on the heavenly motions, the laws that they observe, and the calculation of the motions from a knowledge of these laws. 3. *Sidereal A.*, or whatever is ascertained regarding the universe of the fixed stars. *Practical A.* might form another division, which would include a knowledge of the various astronomical instruments; and a familiarity generally with the rules and calculations by which the requisite results are deduced from observations.

For parts of this extensive subject, see ABERRATION OF LIGHT: AEROLITES: CIRCLE: COMET: ECLIPSES: EQUATOR: LIBRATION: METEORS: MOON: NEBULÆ: PARALLAX: PLANETIDS: PLANETS: PRECESSION: REFRACTION: SOLAR SYSTEM: STARS: SUN: TRANSIT INSTRUMENT: etc. See also the principal names mentioned in the brief sketch of the history of astronomical discovery which follows here.

The history of A. dates from a very early period. It is the most ancient of all the sciences. The Chinese, Hindus, Chaldæans, Egyptians, and even the Greeks, are known to have investigated the heavens very long before the Christian era. But with the first four nations, A. may be said to have been a sentiment rather than a science—a vague notion built up out of crude speculations, rather than a correct theory founded on systematic observation. In China, A. was intimately associated with state politics; the Indians, Chaldæans, and Egyptians made it a matter of religion; and each of these nations applied it to astrological purposes. In Greece alone was it prosecuted for its own sake.

The Chinese, Chaldæans, Hindus, and Egyptians each claim the honor of having been the first students of A., and each has had advocates of its claim. The Tirvalore tables (asserted by the Hindus to belong to an epoch of B.C. 3102—the commencement of the Cali-yug, or iron age, of their mythology—at which period a conjunction of the sun, moon, and planets is said to have occurred) are, so far as their date is concerned, altogether untrustworthy. Modern calculations have conclusively proved that no such conjunction could possibly have taken place at the time specified; and the elements of the tables are, in the general opinion of scientific men, of a character far in advance of the actual observations of that period. There is no doubt

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that the epoch is fictitious—that the date of these tables is fixed much earlier than their internal evidence justifies; but it is a question whether they were the result of the observations of Hindus themselves at some later period before the Christian era, or whether they were constructed after that era from data furnished to them by the Arabs or Greeks. Those who hold the former view, quote the well-known mathematical attainments of the Indians, and their aversion to intercourse with foreigners, as arguments in its favor; those who support the latter, point out that the tables are a mean between those of Ptolemy and Albategnius, or Al Batani, a distinguished Arabian astronomer, and therefore likely to have been derived from these two sources. Those who are interested in the question of the originality of these tables, may refer to Delambre, and to Bailly's *Hist. de l'Astronomie Indienne*.

The Chinese have astronomieal annals claiming to go back to B.C. 2857. In these there is little record of anything but of the appearance of comets and solar eclipses; and regarding the latter phenomena, they tell nothing, save the fact and date of their occurrence. Professional astronomers were compelled to predict every eclipse under pain of death. The popular idea was, that an eclipse was a monster having evil designs on the sun, and it was customary to make a great noise, by shouting, beating of gongs, etc., in order to frighten it away from its solar prey. The many eclipses which the Chinese report have been recalculated, but not more than one anterior to the time of Ptolemy could be verified. At an early period, however, the Chinese appear to have been acquainted with the luni-solar cycle of nineteen years (introduced into Greece by Meton, and since known as the Metonic Cycle), and they had also divided the year into $365\frac{1}{4}$ days. Solstitial observances are said to have been made by means of a gnomon, B.C. 11th c. To the burning of all scientific books by one of their princes (Tsin-Chi-Hong-Ti), B.C. 221, the Chinese attribute the loss of many theories or methods previously in use. The precession of the equinoxes was not known to the Chinese until A.D. 400, but long before that they were familiar with the motion of the planets.

The mass of evidence points to the plains of Chaldæa as the primal seat of observative A. The risings and settings of the heavenly bodies and eclipses were subjects of observation and notation by their priests at a very remote period. Simplicius and Porphyry mention that there was transmitted to Aristotle from Babylon, by order of Alexander the Great, a catalogue of eclipses observed during 1,903 years preceding the conquest of that city by the Macedonians. Ptolemy gives six of the eclipses from this catalogue, but the earliest does not extend further back than B.C. 720. The probability therefore is, that the statement of Simplicius, as to their early date, is an exaggeration. In these observations, the time is given only in hours, and the part of the diameter eclipsed within a quarter; but rough as they are, they are the earliest trustworthy observations extant; and a comparison of them

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with modern observations led Halley to the discovery of the doctrine of the moon's acceleration—that is, that she now moves round the earth with greater velocity than formerly. It is remarkably illustrative of the Chaldæan habit of diligent observation, that the Chaldæans were acquainted with the cycle of $6,585\frac{1}{2}$ days, during which the moon makes about 223 synodical revolutions, and experiences the same number of eclipses, alike, too, in order and magnitude, comparing cycle with cycle. The clepsydra as a clock, the gnomon for determining the solstices, and a hemispherical dial for ascertaining the positions of the sun, were used by the Chaldæans, and they have the credit of the invention of the zodiac and the duodecimal division of the day.

The Egyptians, it is supposed, were the first instructors of the Greeks in A. They do not, however, appear to have observed much for themselves. The meaning of what data they have left behind them can be guessed at in only a few instances. No mention is made by Ptolemy of the idea ascribed to them, that the planets Mercury and Venus moved round the sun; the probability therefore is, since Ptolemy was not likely to overlook such a novel theory, that they entertained no such notion at the time of his visit, but that it is an after-thought of later ages. From the accuracy with which some of the pyramids face the cardinal points, there is a supposition that they must have been erected for astronomical purposes; but if it be true, as is stated, that Thales taught the Egyptians how to find the height of the pyramids by the shadow, and that the latter informed Herodotus that the sun had twice been seen to rise in the west, the conclusion is that the A. of the ancient Egyptians was very meagre and absurd.

Before this point of history, A. is little else than tradition. The Greeks have the honor of elevating it into the dignity of a science. Thales (B.C. 640), founder of the Ionic school, laid the foundation of Greek A. He it was who first set forth the theory of the earth's sphericity. The sphere he divided into five zones. He predicted the year of a great solar eclipse, but this it is now supposed he must have casually succeeded in doing—the Greeks at this time having no observations of their own to guide them—by means of the Chaldæan Saros, or period of eighteen years and ten days, which gives a regular recurrence of eclipses. He made the Greeks, who, prior to his time, were content to navigate their vessels by the Great Bear—a rough approximation to the north—acquainted with the lesser constellation of that name, a much better guide for the mariner. His system, however, contained much absurdity. Among other things, he held that the stars were composed of fire, and that the earth was the centre of the universe. The successors of Thales held opinions which in many respects are wonderfully in accordance with modern ideas. Anaximander, it is said, held that the earth moved about its own axis, and that the moon's light was reflected from the sun. To him is also attributed, on somewhat slender authority, the belief in the grand idea of the plurality of

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worlds. Anaxagoras, who transferred the Ionic school from Miletus to Athens, is said to have offered a conjecture that, like the earth, the moon had habitations, hills, and valleys.

Pythagoras (B.C. 500), the next astronomer of eminence, was far in advance of his predecessors. He promulgated, on grounds that were fanciful, the theory, since established, that the sun is the centre of the planetary world, and that the earth circulates round it. Pythagoras also first taught that the morning and evening star were in reality one and the same planet. But the views of Pythagoras met with little or no support from his successors until the time of Copernicus. Between Pythagoras and the advent of the Alexandrian school, nearly a couple of centuries later, the most prominent names in astronomical annals are those of Meton (B.C. 432), who introduced the luni-solar cycle, and in conjunction with Euctemon observed a solstice at Athens, B.C. 424; Callippus (B.C. 330), who improved the Metonic cycle; Eudoxus of Cnidus (B.C. 370), who brought into Greece the year of $365\frac{1}{4}$ days, and wrote some works on A.; and Nicetas of Syracuse, who is reported to have taught the diurnal motion of the earth on its axis.

To the Alexandrian school, owing its existence to the munificent Ptolemies, the world owes the first systematic observations in A. Hitherto the truths of A. rested on no better evidence than the conjectures of sagacious minds, and these being opposed to the testimony of the senses, met with but little acceptance from the world. The Alexandrian school originated a connected series of observations relative to the constitution of the universe. The positions of the fixed stars were determined, the paths of the planets carefully traced, and the solar and lunar inequalities more accurately ascertained. Angular distances were calculated with instruments suitable to the purpose by trigonometrical methods, and ultimately the school of Alexandria presented to the world the first system of theoretical astronomy that had ever comprehended an entire plan of the celestial motions. The system we know to be false, and inferior to the Pythagorean notions; but it had the merit of being founded upon a long and patient observation of phenomena, a principle which finally brought about the destruction of the system, while the previous theories were the results of mere hypothesis.

The most interesting points in the early history of the Alexandrian school are the attempts made to determine the distance of the earth from the sun, and the magnitude of the terrestrial globe. Aristarchus of Samos—the pioneer of the Copernican system, as Humboldt calls him—is the author of an ingenious plan to ascertain the former. See ARISTARCHUS OF SAMOS.

Among the eminent members of this school were Timocharis and Aristyllus, who made the observations which, together with observations of Hipparchus (q.v.) enabled the latter to discover the precession of the equinoxes; Eratosthenes (q.v.), the first who attempted to determine on true principles the magnitude of the earth, and to clear, as

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Humboldt expresses it, 'the description of the earth from its fabulous traditions'; and Autolycus, whose books on A. are the earliest extant in the Greek language.

With Hipparchus of Bithynia (B.C. 160-125), far the greatest name of all in astronomical science down to that period, begins the real written history of scientific A.; for not until his era were there facts verified and sufficient in number on which to build a system. Hipparchus was at once a theorist, a mathematician, and an observer. He catalogued no less than 1,081 stars—the first trustworthy catalogue that we have. He discovered the precession of the equinoxes; he determined, with greater exactitude than his predecessors had done, the mean motion, as well as the inequality of the motion of the sun, also the length of the year. He determined the mean motion of the moon, her eccentricity, the equation of her centre, and the inclination of her orbit; and he suspected the inequality afterwards discovered by Ptolemy (the evection). He invented processes analogous to plane and spherical trigonometry, and was the first to use right ascensions and declinations, which he afterwards abandoned in favor of latitudes and longitudes.

For more than two centuries and a half after the demise of this indefatigable astronomer, no name of note appears. Ptolemy (A.D. 130-150) is the next who rises above the mass of mediocrities. Besides being a practical astronomer, he was accomplished as musician, geographer, and mathematician. His most important discovery in A. was the libration or evection of the moon. He also was the first to point out the effect of refraction. He extended and improved many of the theories of Hipparchus, and was the founder of the false system known by his name, universally accepted as the true theory of the universe, until the researches of Copernicus overthrew it. The Ptolemaic system, expounded in the *Great Collection*, or, as it was called by the Arabs, the *Almagest*—from which source most of the modern knowledge of Greek A. is derived—placed the earth immovable in the centre of the universe, making the entire heavens revolve round it in the course of twenty-four hours.

With Ptolemy closes the originality of the Greek school. His successors were men of no mark, confining themselves for the most part to astrology, or to comments on earlier writers. To the Arabs are due the next advances in A. They commenced making observations A.D. 762, in the reign of the Caliph Al Mansur, who gave great encouragement to science, as did also his successors, the 'good Haroun Alraschid' and Al Mamoun. both of whom were diligent students of A. For four centuries, the Arabs prosecuted the study of the science with assiduity, but they are meritorious chiefly as observers. They had little capacity for speculation, and throughout held the Greek theories in superstitious reverence. They, however, determined with much more accuracy than the Greeks had done the precession of the equinoxes, the obliquity of the ecliptic, and the solar eccentricity; and the length of the tropical

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year was ascertained within a few seconds of the truth. The most illustrious of the Arabian school were Albategnius or Al Batani (880), who discovered the motion of the solar apogee (see ANOMALISTIC YEAR), and who was also the first to make use of sines and versed sines instead of chords; he corrected the Greek observations, and was altogether the most distinguished observer between Hipparchus and the Copernican era; and Ibn-Yunis (1000), an excellent mathematician, who made observations of great importance in determining the disturbances and eccentricities of Jupiter and Saturn, and who was the first to use cotangents and secants.

In northern Persia, an observatory was erected by a descendant of the renowned warrior Genghis Khan, where some tables were constructed by Nasir-Eddin; and at Samacand, Ulugh Beg, a grandson of Timur, made, 1433, many observations, and the most correct catalogue of stars which, down to his time, had been published.

In the 13th c., A. was again introduced into western Europe, the first translation from the *Almagest* being made under the emperor Frederick II. of Germany, abt. 1230; and in 1252 an impulse was given to the science by the formation of astronomical tables under the auspices of Alfonso X. of Castile. An Englishman, named Holywood (Sacrobosco), 1220, wrote a book of great repute in its day on the spheres, chiefly abridged from Ptolemy; and among others who did much to promote a taste for A. were Purbach (1460), Regiomontanus (John Muller, died 1476), and Waltherus, pupil of the latter, who made numerous observations of merit.

At this point comes into view the illustrious name of Copernicus (1473-1543), to whom was reserved the grand honor and the danger—for there is ever danger in bringing old notions into disrepute by introducing new truth—of disproving the Ptolemaic idea, and of promulgating a correct though imperfect theory of the universe. His system is in some part a revival and systematic application of the opinions said to have been held by Pythagoras. It makes the sun the immovable centre of the universe, around which all the planets revolve in concentric orbits, Mercury and Venus within the earth's orbit, and all the other planets without it. In the Copernican theory, there remained many of the old notions since shown fallacious. It is a current belief that Copernicus, afraid to state boldly such heterodox views of the universe as those he entertained, gave them forth in the form of an hypothesis. Humboldt (*Cosmos*, vol. ii. p. 345), denies that he did so. This distinguished authority says: 'The language of Copernicus is powerful and free, and bursts forth from his inmost convictions, and thus sufficiently refutes the ancient opinion, that he has brought forward the system which is immortalized by his name, as a hypothesis made for the convenience of calculating astronomers, or as one which has but a probable foundation.' The same author also refutes the popular notion that Copernicus died a few hours after receiving a printed copy of his book. He was broken down

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in body and mind when his work *On the Revolutions of the Heavenly Bodies* was brought to him, but he did not die until 'many days afterwards, 1543, May 24.'

Among the contemporaries of Copernicus were Rheinholt, who constructed the Prutenic tables; Recorde, the first to write on A. in English; and Nonius, a Portuguese, who invented a method for dividing the circle. The study of A. was also much aided about this time by the liberality of the Landgrave of Hesse-Cassel, William IV.

Decidedly the most industrious observer and eminent practical astronomer from the time of the Arabs to the latter half of the 16th c. was Tycho Brahé (1546-1601). Considerable odium attaches to him on account of his repudiation of the Copernican system, but it should not be forgotten that in the time of Tycho that system was not supported by the conclusive evidence which now renders it unquestionable. Tycho's system, which made the sun move round the earth, and all the other planets round the sun, they moving with it round the earth, explained all natural phenomena then observed equally well, while it must have appeared more probable than the crude and, at that era, undemonstrable theories of Copernicus. Tycho Brahé compiled a catalogue of 777 fixed stars, more nearly perfect than any previous. He made the first table of refractions, and discovered the variation and annual equation of the moon, the inequalities of the motion of the nodes, and the inclination of the lunar orbit, and rejected the trepidation of the precession, which had hitherto injuriously affected all tables. He also made some interesting cometary investigations.

To his researches are mainly due the discovery by Kepler (1571-1630) of those famous laws which have rendered his name immortal. See KEPLER. To Kepler is due the credit of divesting the Copernican system of its absurdities. Kepler is also said to have had some notion of the law of gravitation.

Galileo Galilei (1564-1642) first applied to the investigation of the heavens the telescope, which he made from a general description of the instrument of Hans Lipperhey of Holland, first inventor of the telescope. He was rewarded by the discovery of the inequalities on the moon's surface. The important discoveries of the four satellites of Jupiter, the ring of Saturn—not then distinctly recognized as a circle—the spots on the sun, and the crescent form of Venus, followed in quick succession. For propagating the Copernican doctrine of the universe, Galileo incurred the displeasure of the Roman Church, and was compelled by the Inquisition to retract his opinions.

But the eternal laws of nature are not to be suspended by the recantation of a philosopher forced by the tyranny of priestcraft. The earth moved onward round the sun in spite of both; and scientific truth was now too old to remain in the restrictive leading strings of any ecclesiasticism.

The next great epoch in the history of A. brings into view England and Newton (1642-1727). In the interval,

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practical A. had profited largely by the logarithms of Napier; the mathematical researches of Descartes; the application of the telescope to the quadrant by Gascoigne, an Englishman, and afterwards by Auzout and Picard; by Römer's discovery of the progressive motion, and measurement of the velocity, of light; by the invention of Vernier; and the application of the pendulum to clocks by Huygens, who also brought into use the spiral spring, and made some valuable observations on the ring and satellites of Saturn; as well as by the investigations of Norwood, Horrocks, Hooke, Hevelius, Gilbert, Leibnitz, and Dominicus Cassini, to the last of whom especially the scientific world owes much. Among a variety of valuable observations and discoveries may be mentioned his thorough investigation of the zodiacal light, his determination of the rotations of Jupiter and Mars, and of the motions of Jupiter's satellites from their eclipses, his discovery of the dual character of Saturn's ring; also of four of his satellites. Newton's fame rests upon his discovery of the law of gravitation, upon which the common belief is that he was led to speculate by the fall of an apple. Newton announced his discovery in the *Principia*, 1687, which was briefly that every particle of matter is attracted by, or gravitates to, every other particle of matter, with a force inversely proportioned to the squares of their distances. The first gleam of this grand conclusion is said to have so overpowered Newton that he had to suspend his calculations, and to call in a friend to finish the few arithmetical computations that were incomplete. This discovery is perhaps the grandest, certainly the most impressive, recorded effort of human genius. Newton made also the important discovery of the revolution of comets round the sun in conic sections, proved the earth's form to be an oblate spheroid, gave a theory of the moon and tides, invented fluxions, and wrote upon Optics.

While the foundations of physical A. were thus broadly laid by Newton, Flamsteed—the first astronomer royal at Greenwich, to whom, until recently, scant justice has been done—and Halley, were greatly improving and extending the practical department of the science. To the former we are indebted for numerous observations on the fixed stars, on planets, satellites, and comets, and for a catalogue of 2,884 stars. His *Historia Cœlestis* formed a new era in sidereal A. Dr. Halley, who succeeded Flamsteed as astronomer royal, discovered the accelerated mean motion of the moon, and certain inequalities in Jupiter and Saturn, but he is most famed for his successful investigations into the motions and nature of comets. His successor was Dr. Bradley, who, in the year of Newton's death, made the important discovery of the aberration of light, which furnishes the only direct and conclusive proof we have of the earth's annual motion. To him also we are indebted for our knowledge of the nutation of the earth's axis. He was, besides, an unwearied observer, and left behind him at his death upwards of 60,000 observations. Altogether, Bradley's is deservedly one of the most honored names in mod-

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ern A. Dr. Maskelyne, who was appointed to the observatory after Bradley, originated the *Nautical Almanac*.

Merely to mention the names of men who from the death of Bradley to the present time have added, by theory and observation, to the knowledge of A., would extend this synopsis much beyond due limit. The 18th c., which opened with lustre derived from the physical demonstrations of Newton, closed magnificently with the telescopic discoveries of Sir William Herschel, who added to our universe a primary planet (Uranus) with its satellites, gave two more satellites to Saturn, resolved the milky-way into countless myriads of stars, and unravelled the mystery of nebulae and of double and triple stars. Laland, Lagrange, Lacaille, and Delambre, in the latter half of the 18th c., did much by their researches and analyses to systematize and improve the science of A. The instrumental means of observation were also, during that time, brought to high perfection. Laplace, in his great work the *Mécanique Céleste* (1799–1808), gave what further proof was needed of the truth and sufficiency of the Newtonian theory.

The 19th c. opened with the discovery of the four small planets—Ceres (1801), by Piazzi; Pallas (1802), and Vesta (1807) by Olbers; and Juno, by Harding, 1804. In 1845, Hencke discovered the fifth of this group revolving between Mars and Jupiter, to which the name of Astræa was given; and by the end of 1892, 357 planetoids (q.v.) had been discovered. The greatest events of the century have been the discovery of the planet Neptune 1846, and the photographing of the heavens.

Observations upon Uranus had shown the motions of that planet to present great irregularities, which could not be explained by the action of Jupiter and Saturn; and after carefully examining the analytical theory of Uranus, Leverrier, a young academicien of France, in the summer of 1846, published the elements of an undiscovered planet, the cause of the perturbations. He boldly declared its existence, calculated its mass, and referred to its place in the heavens; and scarcely a month afterwards, Sep. 23, the hitherto concealed object (Neptune) was found by M. Galle of Berlin. It has been only by accident that France has the honor of this remarkable achievement. Mr. Adams of Cambridge, Eng., had arrived at results more perfect than those of Leverrier, and had communicated them to Mr. Challis, professor of A. at Cambridge, 1845, Sep., a year before the discovery of the planet, and nearly a year before the publication of Leverrier's final calculations. Mr. Challis, it appears, commenced a search for the planet, July 29; and, Aug. 4 and 12, he actually seized the planet, and recorded two positions of it, but did not recognize it, through not comparing his observations, which a pressure of occupation, and an impression that the discovery required a much more extensive search, prevented. But for this, and the non-publication of the Cambridge mathematician's results at the time they were forwarded to Sir George Airy, 1845, Oct., the honorable position of M. Leverrier would have been occupied by Mr. Adams, and that of M. Galle by Mr. Challis.

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Among the astronomical phenomena that in the 19th c have engaged the attention of astronomers, the spots on the sun hold a chief place. Galileo, as we have seen, discerned these spots, but the credit of having been the first to notice them is in dispute between him and four of his contemporaries. Systematic and continuous observation of sun spots were made by Schwabe of Dessau during 46 yrs., 1826-72. The periodicity of the phenomena was soon discovered by Schwabe: he found that the spots wax and wane in frequency in a period of about 11 years. The tables prepared by Schwabe suggested to others a relation between sun spots and magnetic declination—a fact simultaneously noted by several physicists. A relation was also discovered to exist between the sun spot period and auroral phenomena. Prof. Loomis of Yale College finds that the auroral maximum generally occurs a little later than the magnetic maximum. He infers that a sun spot is a result of a disturbance of the sun's surface, which is accompanied by an emanation of some influence from the sun, which is almost instantly felt upon the earth in an unusual disturbance of the earth's magnetism, and a flow of electricity, developing the auroral light in the upper regions of the earth's atmosphere.—Spectrum analysis has in our day yielded results unimaginable to astronomers of an earlier period. When the telescope brought within the reach of vision celestial objects not discernible by the unaided eye, it might well have been believed that in the development of that instrument, and there alone, lay the hope of enlarging man's knowledge of the starry heavens. But the spectroscope analyzes the physical constitution of the most distant orbs, determining their chemical composition, or at least giving evidence of the presence in them or the lack of elements found in our own globe. So, too, the spectroscope pronounces infallibly on the state, whether solid, liquid, vaporous, or gaseous, of distant bodies. The improved methods of analysis and the marvellous advance in the construction of optical and other philosophical instruments, have enabled astronomers to attack the problems of binary or of multiple stars, and to decide whether such groups form systems revolving about one another or around a common centre; of variable stars; the proper motions of stars; the translation of the solar system in space; the constitution of the nebulæ; the nature of the sun's spots and faculæ; the phenomena presented by the solar envelope in eclipses; and the like.—Dr. John William Draper of New York was a pioneer in astronomical photography. His first success was had in obtaining a distinct photograph of the fixed lines in the solar spectrum; he next photographed the moon, 1840. Draper's photograph of the moon was without a parallel till 1889, when, by the aid of the large instrument of the Lick Observatory, Mt. Hamilton, Cal., an image of our satellite, having a diameter of 5 in., was obtained. But in 1890 the two brothers Paul and Prosper Henry of Paris, instead of receiving the image of the moon direct from the telescope on a photographic plate, made it first traverse another lens, which magnified it to 15 diameters; this magnified image was then photo-

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graphed in sections. Dr. Henry Draper, son of John William D., photographed the great nebula in the constellation Orion 1880. Three years later the same nebula was photographed with the most brilliant success by Dr. Commons of Ealing, Eng. Photography has materially helped to solve many problems regarding the constitution of the sun.—As early as 1860 Lewis M. Rutherfurd of New York recognized the great service that might be rendered by photography in constructing maps of the stars, but the suggestion was for a time resultless, and was not acted on till 1882 (and then not intentionally), when Dr. David Gill of the Cape Observatory made his celebrated photograph of the greater comet of that year. The photograph showed distinctly a number of stars down to the 9th magnitude. Two years later stars down to the 16th magnitude were photographed by the brothers Henry of Paris; their photograph of the Pleiades showed 1,421 stars in the neighborhood of that constellation; it also showed a nebula surrounding one of the principle stars, though no nebula had ever been detected by the eye, even when assisted by the most powerful optical instruments. N. B. Wolf of the Paris Observatory had then devoted the whole of 3 years to preparing a chart of the stars in Pleiades, but had catalogued no more than 671 stars. The photograph, exhibiting with the most unimpeachable accuracy 1,421 stars, was the work of three hours. With instruments of still greater precision and delicacy, other photographs have been obtained which show that the constellation Pleiades presents an almost continuous field of nebulous matter. The value of Prof. Rutherfurd's suggestion was thus demonstrated and a stellar map of the whole heavens was projected. An international congress of astronomers was called to meet in Paris 1887 to consider ways and means of executing the project. The congress appointed a commission to procure the construction of a photographic stellar map. The work of constructing the map was allocated in sections to the astronomers of different countries. Each section photograph is to represent the stars in an area of 4 sq. degrees. Before the map is completed no less than 22,000 plates will have been exposed to the sky, each for about an hour. Since 1883 Dr. Edward C. Pickering of the Harvard College Observatory has been engaged in the work of determining the light and color of stars by photography. Photography was first employed in observing a solar eclipse 1869, and by its aid it was proved beyond question that the corona is a solar, not a terrestrial phenomenon.—As a means of determining the proper motion of stars spectroscopic analysis has proved to be of great service. If a star is receding from the point where the observer stands, the wave-length of any portion of its light must be apparently lengthened; if it is approaching, the wave-length must be shortened. The English astronomer Huggins has in this way recognized in some of the brighter stars motions of recession or approach amounting in some cases to 30 or 40 miles per second.—Since the opposition of Mars (1877) that planet has been an object of special study. At that opposition Prof. Asaph Hall of

ASTROPHOTOMETRICAL—ASTURIAS.

Washington discovered the two pygmy moons of Mars, and Prof. Schiaparelli of Milan began that series of studies of the planets' surface which led to his discovery that Mars is covered in its equatorial and temperate zones with a network of straight dark lines which he calls 'canals.' See also the following:

ACCELERATION, ALTAZIMUTH, APHELION, APSIS, ASCENSION RIGHT, CONSTELLATION, COPERNICAN SYSTEM, CYCLE, DAY, EARTH, ECLIPTIC, ELEMENTS, EQUATORIAL, EQUINOXES, GALAXY, GRAVITATION, HARVEST MOON, HORIZON, KEPLER'S LAWS, LAT. AND LONG., LUNAR THEORY, MERIDIAN, MURAL CIRCLE, NODES, NOTATION, OBSERVATORY, OCCULTATION, ORBIT, ORRERY, PENUMBRA, PERIGEE, PERIHELION, PERIOD, PERTURBATION, PHASES, PHOTOGRAPHY CELESTIAL, PTOLEMAIC SYSTEM, SATELLITES, SEASONS, SOLSTICE, TWILIGHT, YEAR, ZODIAC, ETC.

ASTROPHOTOMETRICAL, a. *ās-tro-fō-too-mēt'rik-āl* [Gr. *astron*, a star; *phos*, light; *metron*, a measure]: pertaining to the measurement of the light which reaches the earth from the several stars.

ASTROPHYTON, n. *ās-tro-fī'tōn* [Gr. *astron*, a star, *phuton*, that which has grown]: genus of star-fishes, containing the Shetland Argus.

ASTROSCOPE, n. *ās'tro skōp* [Gr. *astron*, a star; *skopeō*, to look at]: astronomical instrument for representing the relative position of the stars, as delineated on two cones. A celestial globe, however, is more accurate and more convenient.

ASTROTHEROLOGY, *ās tro-thē-ōl'o-jī* [Gr. *astron*, a star; *theologia*, theology]: theology founded on what is known of the heavenly bodies and the laws which regulate their movements.

AS'TUR: see **FALCONIDÆ**: GOSHAWK.

ASTURIAS, *ās-tō'rē-ās* (now OVIEDO, *ō-vē ā'dō*): a northern province of Spain; bounded e. by Santander, s. by Leon, w. by Galicia, n. by the Bay of Biscay. The low hills of Leon and Old Castile rise gradually to the mountain-chain which forms the s. boundary, and towers to about 11,000 ft. in the summit *Peña-de-Peñaranda*. The main road from Leon to Oviedo passes over the mountain-chain at Pajares. The n. slopes are broken by steep and dark valleys or chasms, which are among the wildest and most picturesque in Spain. The summits of the mountains are covered with snow even as late in the year as August. The climate is damp; clouds hang almost continually about the peaks, gathering to them the fogs of the Atlantic. From the mass of calcareous rock, marble crags rise from 200 to more than 400 ft. The principal kinds of wood are oak, chestnut, silver and Scotch firs. In the remoter districts are some superb forests. Alpine pasturage decks the slopes, and a richer covering of green is found in the narrow valleys. In the wider valleys, the soil yields barley, wheat, maize, figs, olives, grapes, oranges. The coasts have good fisheries. The chief minerals of the province are copper, iron, lead, cobalt, arsenic, antimony, and coal. The pasturage of the higher valleys supports an excellent breed of horses, with numerous horned cattle.

A. was never firmly occupied by the Arabs, but afforded a place of refuge to the Goths in the 8th c. Here the fa-

ASTUTE—ASYLUM.

mous Pelayo was made king, A.D. 718; and his successors, after contending successfully against the Arabs, were made kings of Leon in the 10th c. The Asturian still boasts of his independence as a free *hidalgo*, and is simple in manners, and brave, but less industrious and sociable than his neighbors in Biscay and Galicia. Many Asturians leave their province to seek a livelihood in other parts of Spain, and after saving money return to dwell among their native hills and valleys. They have been termed the Swiss of Spain; and they are equally faithful and fond of money. Among them, the *Vaqueros* form a distinct caste, intermarrying among themselves, and leading a nomadic course of life, spending the winter on the sea-coast, and the summer on the hills of Leytariegos. OVIEDO, the cap. of A., has, since 1833, given its name to the whole province.

The eldest son of the Spanish king has the title of Prince of A., professedly an imitation of the English Prince of Wales, having been taken at the solicitation of the Duke of Lancaster in 1388, when his daughter married the eldest son of Juan I. Area of A., 4,091 sq. m.; pop. (1900) 627,069.

ASTUTE, a. *ās-tūt'* [L. *astūtus*, crafty—from L. *astus*, craft, cunning; may be connected with Gr. *astu*, a city, thus meaning one having the shrewdness and cunning of the city]: sagacious; sharp; discerning; crafty. ASTUTE'NESS, n. shrewdness; cunning. ASTUTE'LY, ad. *-lī*.—SYN. of 'astute': cunning; wily; crafty; penetrating; sly; subtle; sagacious; shrewd; keen.

ASUNCION, *ā-sôn-se-ôn'*, NUESTRA SEÑORA DE LA, or ASSUMPTION: city, cap. of Paraguay, on the w. bank of the Paraguay river; lat. 25° 16' s., lon. 52° 42' w. It has a trade in hides, tobacco, wax, and Paraguay tea. It was founded, 1535, by the Spanish, and soon became a place of importance, though not of beauty, being ill-built and dirty. The houses are scarcely better than huts; even the government residence is of one story. The surrounding country is rich in pastures, and produces wheat, maize, sugar, tobacco, honey, wax, etc. A. has much commerce by the river, and important railway connections s. and w. Pop. (1895) 45,000.

ASUNDER, ad. *ā-sūn'dēr* [AS. *a*, on, and *sunder*]: apart; separately; in a divided state.

ASURA, n. *a-sūr'a* [Skr.]: a demon; an enemy of the gods. The name seems to have been given at one time to the Turanian aborigines in conflict with the Aryan invaders of India, and at another to the Buddhist religionists in conflict with the professors of the Brahminic faith.

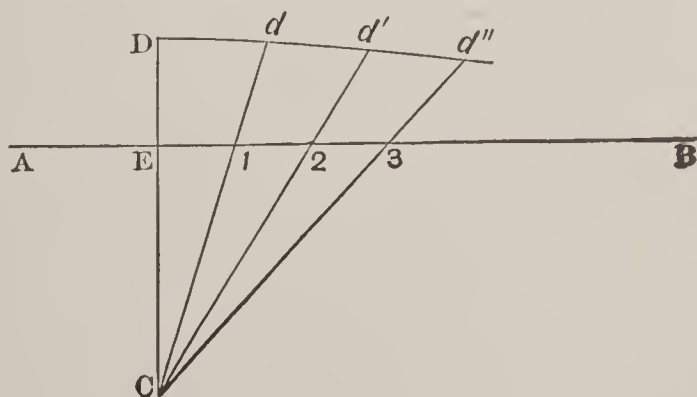
ASYLUM, n. *ā-sī'lūm*, ASY'LUMS, n. plu. [L. *asy'lum*—from Gr. *as'ulon*—from Gr. *a*, not; *sulāō*, I rob or plunder: It. *asilo*. F. *asile*]: a place out of which he that has fled to it may not be taken or robbed; a place of refuge; a sanctuary; a hospital for the insane.—SYN.: a refuge; sanctuary; shelter; retreat. In ancient times, sacred places, especially the temples and altars of the gods, were appointed as asylums to which criminals, as well as persecuted persons, might flee for refuge; and to molest them in such places

ASYMMETRY—ASYMPTOTE.

was regarded as an impiety. An analogous institution is found in the laws of the Jews, Num. xxxv., where six 'cities of refuge' are appointed for persons guilty of manslaughter. Among the Greeks in early times, these asylums may have been sometimes useful in preventing hasty retribution; but in the course of time they were so much abused that their sanctity was in a great measure disregarded. Thus Pausanias, who fled to the altar of Minerva, was taken and slain there by the Lacedæmonians, and in other cases the refugee was compelled to leave the A. by fire or starvation. In Rome, the emperor Tiberius abolished all such places of refuge from law, excepting those in the temples of Juno and Æsculapius. The custom of allowing to real or supposed criminals a place of safety in temples, was adopted also by the ancient Christian Church. In the time of Constantine the Great, the churches were made asylums; and Theodosius II. extended the privilege to all courts, alleys, gardens, and houses belonging to the church. In 681, the synod of Toledo extended the privilege of A. to a space of 30 paces around every church. In the lawless periods of the middle ages, the influence of the church often prevented deeds of gross injustice and violence; but the sanctity of churches was abused by criminals; and this led to several modifications which gradually destroyed the privilege of Sanctuary (q.v.). In England, it was abolished by acts passed 1534 and 1697. The word A. is now applied to places of shelter for unfortunate or destitute persons, and especially to hospitals for the blind, the deaf and dumb, and especially for the insane. See LUNACY.

ASYMMETRY, *n.* *a-sim'mět-rĭ* [Gr. *asymmetria*—from *asymmetros*, incommensurable, unsymmetric; or from *a*, without; *summetria*, symmetry; *summetros*, commensurate with—from *sun*, together; *metron*, a measure]: want of symmetry; want of proportion. ASYM'METRAL, or AS'YM-METRICAL, *a.* not agreeing, inharmonious.

ASYMPTOTE, *n.* *äs'im-tôt* [Gr. *asumptōtus*, not falling together—from *a*, not; *sun*, together; *ptōtos*, apt to fall]: a line that approaches nearer and nearer to some curve with-



Asymptote.

out ever meeting it: ADJ. approaching but never meeting. An example of an A. will be seen under HYPERBOLA. As another illustration, let AB be a straight line which can be produced to any length towards B. Take any point, C,

ASYNARTETE—ATACAMITE.

without the line, and draw a perpendicular reaching to any distance, D, beyond the line; set off any equal distances, E—1, 1—2, 2—3, etc., along AB; and draw C1*d*, C2*d'*, C3*d''*, etc., making 1*d*, 2*d'*, 3*d''* etc., equal to ED. Now, it is evident that each of the points *d*, *d'*, etc., is nearer to the line AB than the one to the left of it; if, therefore, a curve is traced through these points (the curve is called the *conchoid*), it must continually approach the line AB. On the other hand, it is evident that the curve can never meet AB; for a line drawn from C to any point in AB, however distant that point, must, when produced, cross AB. AB is thus an *A.* to the curve. To the senses, indeed, the curve and line soon become one, because all physical or sensible lines have breadth. It is only with regard to *mathematical* lines (see LINE) that the proposition is true; and the truth of it has to be conceived by an effort of pure reason, for it cannot be represented. ASYMPTOTIC, a. *ās-īm-tōt'ik*, or ASYMPTOTICAL, a. [Eng. *asymptote*: F. *asymptotique*]: pertaining or relating to the asymptotes of a hyperbola; perpetually approaching anything, but never meeting it.

ASYNARTETE, a. *ā-sĭn-ār'tēt* [Gr. *asunartetos*, not united, inconsistent—from *a*, without; *sunartao*, to hang up with, to knit or join together—from *sun*, together; *artaō*, to fasten to]: not fitted or adjusted, disconnected. ASYNARTETE SENTENCE, in *gram.*, a sentence of which the members are not united by connective particles. ASYNARTETE VERSE, in *pros.*, a verse consisting of two members, having different rhythms; as when the first consists of iambuses and the second of trochees, or the first of dactyls and the second of iambuses.

ASYNDETON, n. *ā-sĭn'dē-tōn* [Gr. *a*, not; *sundētos*, bound together]: a figure in *rhet.*, which keeps the parts of speech together without the use of conjunctions—as, 'heal the sick, cleanse the leper, raise the dead, cast out devils'—where the connecting word 'and' is omitted.

AT, prep. *āt* [AS. *aet*: Icel. *at*: Dan. *ad*: Skr. *adhi*, upon: L. *ad*, to]: near to; beside; in or near; with; towards. AT LAST, denoting the end has been reached after interruptions, disappointments, etc. AT LENGTH, denoting the goal or end has been reached after a long period or interval of time—this phrase and preceding often used synonymously.

ATACAMITE, n. *a-tāk'-a-mīt*: a native ore of copper, called also copper-sand; abundant in some parts of S. America, as in the desert of *Atacama* between Chili and Peru, from which it derives its name; at Remolinos, Santa Rosa, and other districts in Chili, and at Sarapaca in Bolivia, where it is associated in veins with ores of silver; found also as a crust in the lavas of Vesuvius and Etna, especially on those of Vesuvius erupted in the years 97, 1804, 1820, and 1822. The natural varieties of A. are crystallized, massive, and pulverulent or granular. The massive or compact variety is usually reniform, with a fibrous structure. The crystals are short and needle-shaped; the primary form is a rhombic prism. It has

ATAGAS—ATAHUALPA.

been sometimes incorrectly described as a chloride of copper; and sometimes as a hydrochlorate (muriate) of copper; it is to be regarded rather as a hydrated cupric oxychloride, $\text{CuCl}_2, 3\text{CuH}_2\text{O}_2$. It is a rich and productive ore, containing about 55 or 60 per cent. of copper. The percentage composition of various specimens of A. is as follows:

	Copper Protoxide	Muriatic Acid.	Water.	Total.
Compact atacamite.....	72·0	16·3	11·7	100
“	76·5	11·0	12·5	100
Sandy atacamite.....	70·5	11·5	18·0	100
Crystallized atacamite...	73·0	16·2	10·8	100

A. forms often on the surface of copper exposed to the air or sea-water; and the greenish incrustation observed on antique bronze utensils, weapons, and other articles, and commonly known as the *æruugo nobilis*, is composed of this salt. On some antique bronzes from Egypt the A. is crystalline. A. is worked in South America as an ore of copper; and considerable quantities are sent to England to have the metal extracted therefrom. See COPPER.

ATAGAS, n. *ât'a-gās*: a gallinaceous bird, the red cock.

ATAGHAN, n. *ât'a-găn*, or YAT'AGHAN [Fr. *yataghan*—from Turk. *yatagân*]: a long dagger worn with pistols in the belt, in a metal scabbard, generally of silver, and among the wealthier gilt, or of gold.

ATAHUALPA, *â-tâ-hwâl'pâ*: d. 1533: favorite son of Huayna Capac, Inca of Peru (d. 1525). The father's death was about seven years before Pizarro's arrival in Peru. The mother of A. not being of the pure Inca blood, her son was formally excluded from inheriting the throne; but his handsome figure, bold spirit, and quick intelligence so won upon the affections of his father, that on his death-bed he declared it to be his will that A. should receive as his portion the ancient kingdom of Quito (recently conquered), while Huascar, his eldest son, should possess Peru. For five years the brothers lived on terms of real or apparent friendship; but at length the restless ambition of A., who was constantly aspiring to new conquests, excited the uneasiness of Huascar, who, in an evil hour, was induced to send an envoy to his brother, with instructions to require him to render homage for his kingdom of Quito. A. fired at the proposal, and war was instantly declared. Placing himself at the head of the army of veterans which his father had left him, he invaded Peru, and in the spring of 1532 completely defeated Huascar on the plains of Quipaypan, in the neighborhood of Cuzco, the native Peruvian metropolis, only a few months before the arrival of the Spaniards. Huascar was taken prisoner and confined in the strong fortress of Xauxa. Then followed, according to Garcilasso de la Vega, a series of atrocious massacres of all in whose veins ran the blood of the Incas; but his statements are so monstrous, and have so little congruity, that they are rejected by Prescott as intrinsically incredible. In the meantime, the Spaniards had disembarked at Tumbez; and after a long, brave, and perilous march through

ATALANTA.

the unknown country, Pizarro, at the head of his two hundred cavaliers, approached the victorious camp of A., where he found some fifty thousand men assembled. By a daring but diabolical stratagem, Pizarro obtained possession of the person of the king, who had come to visit him in a friendly spirit. While a priest was explaining the Christian religion, and the power of the pope over all the kingdoms of the earth, and how the pope had presented Peru to the Spanish monarch, in whose name they had come, A., indignantly interrupting him, told him that the pope (whoever he was) must be a crazy fool to talk of giving away countries which were not his own. When he inquired on what authority such claims were made, the priest pointed to the Bible, on which A. dashed the book on the ground, and the fields began to fill with Indians. The moment was critical. The crime which Pizarro had resolved upon the night before must be executed then or never. He waved a white scarf, which was the signal agreed upon. The mysterious artillery poured sudden death into the terrified masses of Peruvians, while the Spanish cavalry rode them down with merciless fury. Confusion seized the natives; they submitted—being unarmed—to this terrible butchery, only anxious to save their sacred Inca; but all their efforts to accomplish this proved unavailing, and after exhausting hours in the miserable work of murder, the inhuman Spaniards succeeded in capturing him. A. was treated with a great show of kindness at first, and more especially when he offered as a ransom, ‘not merely to cover the floor, but to fill the room in which he stood with gold as high as he could reach.’ When A.’s brother, Huascar, who was still a prisoner, heard of this, he offered still more advantageous terms for himself. To prevent this, A. had him secretly assassinated. The golden treasure which was to constitute the ransom of A. now began to pour in, and at length A. demanded his freedom. This Pizarro refused to grant, and accused A. of plotting against him. The result, after much base treachery on the part of the Spaniard, was a mock trial, in which A. was condemned to be burned; he was led to the stake, 1533, Aug. 29; but on agreeing to be ‘baptized’ his sentence was commuted to death by strangulation.

ATALANTA, *ăt-a-lăn'ta*: a mythical personage, daughter of Iasus and Clymene; b. in Arcadia; celebrated as a huntress, skilled in the use of the bow and arrow. Her father, who had wished a son, exposed her, while an infant, on Mount Parthenios, where she was found near the entrance of a cave by hunters, who brought her up, and afterwards restored her to her parents. While living as a wild mountain-maiden, she slew the centaurs Rhœcus and Hylæus. Afterwards she sailed with the Argonauts (q.v.) to Colchis, and was prominent in the chase of the Calydonian boar (q.v.). She had many suitors, but was merciless in the conditions which she imposed on them. Being the swiftest of mortals, she offered to become the wife of him that should outstrip her—the penalty of defeat being death. At length she was conquered by a trick of one Meilanion,

ATALIK-GHAZEE—ATCHESON.

whom she was compelled to marry. He obtained from Venus a gift of three golden apples, which he successively dropped in the race; and A. was so charmed by their beauty, that she could not refrain from stooping to gather them, and so lost.—Mention is made of another A. in Greek antiquity, to whom a different parentage is assigned, but regarding whom the myth is essentially the same.

ATALIK-GHAZEE, n. *á-tál'ík-gá'zē* [Hind. *atalik*, a private tutor, a preceptor: Arab, Hind. *ghazi*, a Moham-medan hero, especially if victorious in the battle against the 'infidel']: title given to the ruler of eastern Turkestan.

ATARAIPU, *á-tá-rī-pó'* [signifying *Devil's Rock*]: a singular eminence in British Guiana, a granite pyramid, which rises abruptly from the plain abt. 900 ft., wooded for rather more than one-third of the height, but bare thence to the peaked summit.

ATAVISM, n, *át'a-vīzm* [L. *atāvus*, an ancestor—from *avus*, a grandfather]: the reappearance of any peculiarity of a family in a generation, after a period of latency; in *zool.*, the tendency of species or varieties to revert to an original type. Darwin used the term *reversion to type* as almost a synonym for Atavism.

ATAXIC, a. *ă-tăk'sík*, or ATACTIC, a. *ă-tăk'tík* [Gr. *a*, without; *taxis*, order—from *tasso*, I put in order]: wanting order; irregular. ATAXIA, n. *ă-tăk'sî-a*, irregularity; want of co-ordination in the movements of a limb or organ.

ATBARA, or BAHR-EL-ASWAD: see NILE.

ATCHAFALAYA, *ăch-af-a-lī'a*: a branch of the Mississippi at its delta. It forms so large an angle with the main river, that, after a course of only 130 m., it enters the Gulf of Mexico, 120 m. to the w. of New Orleans. From the Red river, which enters the Mississippi just above its own point of departure, the A. had received so much drift-wood, that some years since a stationary raft had been formed, 10 m. long, 220 yds. broad, and 18 ft. deep—an obstacle to navigation which the state of Louisiana required four years to remove.

ATCHEEN, *ăt-chēn'*: till 1873 an independent kingdom forming the n.w. part of Sumatra; 20,471 sq. m. The interior is mountainous, Abong Abong attaining a height of 10,988 ft. The natives are well made, industrious, intelligent, but treacherous. In 1873, the Dutch declared war, and, though at first repulsed, by 1879 had wholly conquered the country. Pop. (1890) 110,804, of which 196 European. The people barter for opium with Penang and Singapore, pepper, edible nests, gold-dust, camphor, benzoin, sulphur, satin-wood, betel nuts, etc.

A., the cap., lies on both sides of the river, 5° 35' n. lat., 95° 26' e. long.; in a large valley formed by ranges of hills, of which the Golden Mountain is the highest. Pop. 36,000.

ATCHESON, n. *ăt'chě-son*, or ATCHISON, n. *ăt'chĩ-son* [named after Mr. Atkinson (or the Scotch pronunciation Atcheson), an Englishman who was assay-master of the

ATCHEVEMENT—ATELES.

mint at Edinburgh in the beginning of James VI.'s reign]: a copper coin, washed with silver, struck in the reign of James VI.: value, eight pennies Scotch, or $\frac{2}{3}$ of an English penny.

ATCHEVE'MENT: term nearly equivalent to armorial bearings and often used of a funeral escutcheon. See HATCHMENT.

ATCHISON, *äch'ĩ-sũn*: city in Kansas, cap. of Atchison co., pleasantly situated on the right bank of the Missouri river at the extreme point of the 'Great Bend' of that stream. It is abt. 30 m. above Leavenworth, the e. terminus of the A. & N. railroad and of the Central Branch of the Union Pacific railroad, the w. terminus of the Missouri Pacific railroad, the n.w. terminus of a branch of the Chicago Rock Island & Pacific railroad, and the e. terminus of the Atchison Topeka & Santa Fé railroad. It is a very important railroad centre; on the eight roads which meet here ninety or more trains arrive and depart daily. It has large and varied industries, particularly in flour mills, machine shops, engine works, and furniture and carriage factories. Its commerce is extensive and rapidly growing. In 1892 it was the third city in the state in distribution of milling products and of general incoming products; had 8 m. of paved streets, 4 m. of sewers, electric light plant, new union depot, 3 national banks (cap. \$250,000), 2 state banks (cap. \$140,100), 1 trust co., 3 daily, 3 weekly, and 1 monthly periodicals, 6 public schools, 14 churches, several public halls, public library, city hospital, and the State Soldiers' Orphans' Home. Among its educational institutions were the Western College of the Gen. Synod of the English Evang. Luth. Church; St. Benedict's College; and the Atchison Institute, founded 1870. A fine iron bridge crosses the Missouri river, connecting the city with the railroad lines that terminate on its e. bank. In 1891 the assessed valuations were: real \$2,355,110, personal \$492,970, railroad \$110,930. Pop. (1890) 13,963; (1900) 15,722.

ATE, v. *āt* or *ēt*, pt. of EAT, which see.

ATE, n. *ā'tē*, in *Gr. myth.*: according to Homer, the daughter of Jupiter—or of Eris, as Hesiod says—a vengeful goddess, ever attending *dysnomia*, or transgression of law, though she herself prompted men to transgress. She was banished from Olympus by Jove, whom she had incited to take an oath of which he subsequently repented. She then travelled swiftly to and fro over the earth, always intent on exercising a pernicious influence upon mankind. But her steps were followed by the goddesses *Litai* (prayers), benevolent daughters of Jove, who healed those who had been afflicted by A. The tragic writers describe A. as the goddess of retribution. Their representations almost identify her with NEMESIS and ERINNYS.

ATEAL, ATTEILLE, n. *a-tēl'*, or ATTILE, *-īl* [*teal*]: Scotch name of a duck, the Widgeon (*anas penelope*), or an allied species.

ATELES, *āt'ē-lēz* [Gr. incomplete]: genus of American monkeys, of the division with long prehensile tails, to

ATELESTITE—ATELIERS NATIONAUX.

which the name Sapajou (q.v.) is sometimes collectively applied. In the genus *A.*, the head is round, and the facial angle about 60°; the limbs are remarkably long and slender, upon which account the English name Spider Monkey (q.v.) is sometimes used as a generic designation; and the forelimbs are either entirely destitute of a thumb, or have a mere rudimentary one, a peculiarity in allusion to which the name *A.* was given. The name Coaita or Quata is frequently given to some of the species of *A.*, but is sometimes limited to *A. Paniscus*, as Spider Monkey sometimes is to *A. arachnoides*. One of the best-known species is the Marimonda (*A. Belzebub*), a common monkey of Guiana, immensely numerous on the banks of the Orinoco.

ATELESTITE, n. *ăt-těl'ēs-tīt* [Gr. *ateles*, incomplete]: so spelled in Dana's System, 1892—formerly ATELESITE, and then classed under Eulytine, a bismuth silicate: a rare yellow mineral, bismuth arsenate. ATELITE is a copper chloride, volcanic.

ATELIER, n. *ăt-ěl-yā* [F.]: the workroom of a painter or sculptor—called also a 'studio.'

ATELIERS NATIONAUX, *ăt-ěl-yā nă-sĩ-ō-nō*, or NATIONAL WORKSHOPS: establishments for governmental provision of work, and organizing of labor; notable in connection with the French revolution of 1848. Immediately after the downfall of Louis Philippe, and the formation of the provisional govt., 1848, Feb., a permanent dept. was established, called *The Committee of the Government for the Workmen*, acting on the doctrine that all workmen were entitled to a living provided for them on a certain uniform scale. While private employment was not forcibly abolished, inducements were held out which made workmen leave and employers break up the existing establishments. Consequently, nearly all the Parisian workmen threw themselves on the govt., and others flocked in, in alarming numbers—mostly with little idea of the duty of working, even were there distinct employment for them. One incidental experiment illustrates the condition. In the Hôtel Clichy, 1,500 tailors were assembled to make uniforms for the new *garde mobile*. The men were to receive among them for the completed work as much as an army-contractor would have demanded; meanwhile they were paid two francs a day for subsistence; the rest was to be divided among them at the end. The men, expecting to receive not only their proper wages, but also the enormous sum which they supposed to form the profit of the contractor, were wild with disappointment when they found nothing to divide. There was, in fact, a loss. Early in May the body of workmen dependent on the govt. had increased to 130,000; and when the govt. found it necessary to abolish the system, the discontent fermenting in Paris was kindled into the armed insurrection put down by the national forces under Cavaignac, only after the terrible fighting of the *Days of June*. Advocates of the principle of competition as against the theory of governmental organization of labor adduce the A. N. as a test showing the latter an utter failure. On the other side it is claimed that the times and

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the social conditions rendered a real test impossible—the govt. a mere expedient staggering through a few months of transition to despotism, and society itself a heaving sea. See COMMUNISM: SOCIALISM: BLANC, LOUIS.

ATELLANÆ, *a-těl-lā'nē*, *Fabulæ Atellanæ* (also styled *Luāi Osci*): a kind of popular drama in Rome introduced from Atella, a town in Campania, between Capua and Naples. After the Greek drama had been brought to Rome by Livius Andronicus, the old *Fabulæ Atellanæ* were still retained as interludes and after-pieces. They are not to be confounded with the Greek satiric drama, although their character was to some extent the same. In the latter, satyrs figured; while the former personated real Oscan characters. The *Maccus* and *Bucco* of the *Fabulæ Atellanæ* may be considered the origin of the modern Italian *arlecchino* (harlequin), and other characters of the same stamp. They were the favorite characters; spoke the Oscan dialect, and excited laughter by its quaint old-fashioned words and phrases. The A. were neither so dignified as the *comædia prætextata*, nor so low as the *comædia tabernaria*, but indulged in a kind of genial and decent drollery. The caricature was at first always pleasant, and though quizzical, it did not lapse into obscenity, like the *mimi*. Respectable Roman youths, who could not appear as actors in the regular Greek drama without losing *caste*, were allowed to take parts in the A. A few fragments of these popular farces have been collected by Bothe in his *Poetarum Latinorum Scenicorum Fragmenta* (Leip. 1834). See also Munk. *De Fabulis Atellanis* (Leip. 1840).

A TEMPO—ATHABASCA.

A TEMPO, ad. *ă-těm'pō* [It. in time]: in *music*, used to indicate that the interrupted time is to be restored.

A TEMPO GIUSTO, *ă těm'pō jós'tō* [It., in correct time]; in *mus.*, used to denote that, after a recitative, the performer should keep the music true and correct, which, during the recitative, had been altered to suit the action and passion of the scene.

ATER, *ă'tēr* [L. *ater*, black]: pure black; as a prefix, spelt *atro*.

ATESHGA, *ă'těsh-gă'* [the Place of Fire]: a spot on the peninsula of Apsheron, on the w. coast of the Caspian Sea. It is considered sacred by the Guebres, or Persian Fire-worshippers, who visit it in large numbers, and bow before the holy flames which issue from the bituminous soil. It is about a mile in diameter, and from its centre, in clear dry weather, creeps forth a blue flame (caused by the ignition of the naphtha), which shines with great brightness by night.

ATESSA, *ă-těs'să*: town of s. Italy, province of Chieti; 23 m. s.s.e. from Chieti. It has a beautiful collegiate church, and several other churches and convents. Pop. 5,200.

ATEU'CHUS: see **BEETLE**: **SCARABÆUS**.

ATH, or **AATH**, *ăi*: strongly fortified town in the province of Hainault, Belgium; on the Dender; lat. 50° 36' n., long. 3° 46' e. It has an arsenal, hospital, and college, and important manufactures of linen, calicoes, lace, gloves, cutlery, large hammers, etc., and carries on a brisk trade. The ancient church of St. Julien in A. is noted for its extraordinarily high tower. The town has been several times besieged and taken; in 1697, by Catinat and Vauban; in 1706, by the allied forces under the Dutch general Owerkerke; in 1745, by the French after a short siege; and in 1792, by the forces of the Republic under Berneron. Pop. about 10,000.

ATHABASCA, *ăth'a-băs'ka*: river and lake in the n.w. of N. America, forming part of the great basin of the Mackenzie; therefore, in the Northwest Territory of the Canadian Dominion. The *river* rises in the Rocky Mts. near Mount Brown, the highest point in the range. Its actual source is the small lake (see under **AMERICA**), known as the Committee's Punch Bowl, which sends its tribute at once through the A. to the Frozen Ocean, and through the Columbia to the Pacific. Its general course is n.e., till, after passing through A. Lake, or rather crossing its w. end, it turns towards the n.w., and, after a course of 30 or 40 m., unites with the Peace river, from beyond the Rocky Mts., to form the Slave river, which, again, after passing through Great Slave Lake, takes the name of the Mackenzie.—*Lake A.* receives nearly all its waters from the A. river, and is noticeable for the fact that its principal feeder traverses not its length but its breadth, and that not in its middle, but at its extremity. The lake's single outlet is the river A.

ATHABAS'CA: a new division of the Canadian north-

ATHA-BEN-HAKEM—ATHANARIC.

west, between British Columbia and the A. river; formed 1882; 122,000 sq. m. It contains the fertile Peace river districts.

ATHA-BEN-HAKEM: see MOHAMMEDAN SECTS.

ATHALIA, n. *a thā' lī a* [Gr. *athales*, not verdant, withered]: genus of saw-flies, *tenthredinidæ*. *A. spinarum* or *centifolæ* is the Turnip Saw-fly, so called because its larvæ, which are the animals called *blacks* or *niggers*, feed on turnips. The perfect insect is common in some years from May to August. It has a black head, a red thorax, with two large and several smaller spots on the back, and an orange-colored abdomen.

ATHALI'AH: daughter of Ahab, King of Israel, married Jehoram, King of Judah, who died B.C. 885. After the death of her son Ahaziah, who succeeded him, but reigned for only one year, she paved her own way to the throne by putting to death (as she supposed) all the seed-royal. 'But Jehosheba, the daughter of king Jehoram, sister of Ahaziah, took Joash, the son of Ahaziah, and stole him from among the king's sons, who were slain.' The young prince thus rescued was privately educated in the temple, and, after A. had reigned six years, the high-priest Jehoiada placed Joash on the throne (B.C. 878). A., hearing the noise attending the coronation, hastened to the temple, where the people were shouting, 'God save the king!' As she looked round in astonishment on the young king, whom she had supposed to be dead, surrounded by priests, Levites, rulers, captains, and a rejoicing multitude, she 'rent her clothes, and cried, "Treason! treason!"' By the command of the high-priest, she was led out of the temple, and slain in the gateway of the palace. The house of Baal, with its altars and images, was broken down. This narrative (2 Kings xi.; 2 Chron. xxi. 6; xxii. 10-12; xxiii.) is the subject of Racine's drama, *Athalie*.

ATHANARIC, *a-thăn' a-rīk*: King of the Western Goths (d. 381), whose settlements lay on the n. bank of the lower Danube. Because he had taken advantage of the weakness of the Roman empire when the imperial armies were engaged in suppressing the rebellion of Procopius, war was declared against him by the emperor Valens. A. acted strictly on the defensive during two campaigns, in which the Romans gained no advantage over him; but in the third year of the war (369), he hazarded a general battle, and was defeated, whereupon he sued for peace, and with that object had a conference with Valens in a boat on the Danube. Peace was concluded, and A. had his attention occupied in settling dissensions arising out of the Arian controversy which then agitated his people, when the first advance of the Huns on Europe alarmed the Gothic nation. A. attempted to secure the eastern borders of his kingdom; but the Huns forced the passages of the Dnieper, defeated the Goths, and advanced in great force into the plains of Dacia. When, in 374, the Western Goths were received by the Romans as allies, and had settlements granted them on the s. of the Danube, A., with a part of his people, refused to accom-

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pany them, removing to the w, and fortifying himself against the new enemy. In 380, however, he was obliged to retire, when he accepted the hospitality of the empire, and removed to Constantinople, where he was cordially and honorably received by the emperor Theodosius. At this time died Fritigern, King of the Goths, that had settled on the s. of the Danube; and A. being made king of the whole western Gothic nation, concluded a treaty of peace, in behalf of the whole, which had the effect of incorporating that people with the other subjects of the empire. He died at Constantinople.

ATHANASIAN, a. *ăth'a-nă'zhăn*: pertaining to Athanasius, a bishop of Alexandria in the fourth century, or to the creed called by his name. ATHANA'SIAN CREED: third of the three ecumenical symbols, named from its composition being attributed to Athanasius; it is also known, from its initial words in Latin, as the creed *Quicumque Vult*. The first part of this creed contains a detailed exposition of the Trinity; the second, the doctrine of the incarnation. Modern criticism has called in question the title of Athanasius to be considered the author of this creed. It was known as early as the beginning of the 6th c., but not under its present name. It is spoken of as 'Athanasius's Tract on the Trinity,' in some Articles of the middle of the 8th c., and is supposed to be alluded to, 'as the Faith of the holy prelate Athanasius,' in the council of Autun, about 670. Athanasius himself makes no mention of this creed, although its doctrines are essentially his; nor do any of the church fathers. Other two circumstances speak against its authenticity: it is in Latin, and Athanasius wrote in Greek; the expressions, again, are different from those used by Athanasius in speaking of the same things. By Protestants, therefore, and even by most Rom. Catholics, its Athanasian origin has been given up, and its production has been assigned with probability to the 5th c., and to Gaul; Hilary, Abp. of Arles (abt. 430), being conjectured to be the author. The title of Athanasian probably became attached to it during the Arian controversy in Gaul, as being an exposition of the system of doctrine which was opposed to the Arian system, and which would naturally be called Athanasian from its chief propounder. It was received into the public offices of the Gallic Church in the 7th c., and by the middle of the 10th c. it was adopted at Rome and all over the West. In Britain, it was probably in use as early as 800. The Greek Church was late in receiving it, and even then not without altering the article concerning the 'Procession of the Holy Ghost.' The Reformers adhered to the Athanasian Creed, and Luther called it 'a bulwark of the Apostles' Creed.'

The Athanasian Creed is the most rigid and intolerant of the three Catholic symbols, and has given rise to much controversy; and though it is still generally received by many Protestants as well as by Rom. Catholics, the regard once had for it has declined. The points in this creed that give offense to some are defended by others, on the plea that it was drawn up not for the sake of gratuitously dogmatizing on abstruse speculative truths, but to counteract other dog-

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was held to be dangerously heretical. Waterland, in his *Critical History of the Athanasian Creed*, says: 'The use of it will hardly be thought superfluous so long as there are any Arians, Photinians, Sabellians, Macedonians, Apollinarians, Nestorians, or Eutychians, in these parts.' (See these titles.) With respect to what are called the 'damnatory clauses' (the clauses, namely: 'Which Faith except every one do keep whole and undefiled, without doubt he shall perish everlastingly;' and, 'This is the Catholic faith, which except a man believe faithfully, he cannot be saved'), the churches which adopt the creed do not mean by them to imprecate curses, but to declare, as a logical sequence of a true faith being necessary to salvation, that those who do not hold the true faith are in danger of perishing; as it is said, Mark xvi. 16, 'He that disbelieveth shall be condemned.' These clauses are also held to apply to those who deny the substance of the Christian religion, and not infallibly to every person who may be in error as to any one particular article. A rubric to this effect was drawn up by the commissioners appointed in 1689 for the review of the English Common Prayer Book, but none of their suggestions took effect. Compare also the 18th Article of the Church of England with these clauses. It is probably the growing opinion in Britain that this creed may well be spared from the authoritative utterances of the church. It was rejected (1786) from the Book of Common Prayer as adopted by the Prot. Epis. Church in the United States.

ATHANASIUS, *āth-a-nā'shĭ-ŭs*, Primate of Egypt: 296-373; b. Alexandria: there is no record of his lineage or his parents. Alexander, then officiating as primate or patriarch of Alexandria, brought him up in his own family, and superintended his education, with the view of his entering the Christian ministry. In his youth, he often visited the celebrated hermit St. Antony, and embraced for a time the ascetic life with the venerable recluse. He was but a youth and only a deacon when appointed a member of the first general council at Nice, in which he distinguished himself by his erudition and his eloquence.

His patron, Alexander, having died in the following year, he was duly elected to the primacy by the clergy and people; and was but newly installed in his office, when Arius, who had been banished at the time of the condemnation of his doctrine at Nice, was recalled, and made a recantation of his erroneous principles. A., it is said, refused on this occasion to comply with the will of the emperor that the heretic should be restored to communion. On this account, and in consequence of several other charges brought against him by the Arian party, he was summoned by the emperor Constantine to appear before the synod of Tyre, 335, which deposed him from his office. His sentence was confirmed by the synod of Jerusalem in the following year, when he was banished to Treves. In 338, Constantius, now emperor of the East, though unfriendly to the principles of the Trinitarians, recalled A. from his banishment, and restored him to the primacy at Alexandria. His entrance into the city was like a triumphal procession; but the Arians soon rose

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against him, and (in 341) he was again condemned by a council of 90 Arian bishops assembled at Antioch. Against this decision a protest was made by 100 orthodox bishops at Alexandria; and in a council held at Sardis, 300 bishops, with Julius, Bishop of Rome, at their head, confirmed the decision in favor of A., who was again replaced in his office (349). The Arians once more acquired the ascendancy after Constantius (in 353) had been made emperor of both the East and the West; for in that year A. was condemned by a council held at Arles, and the sentence was confirmed by another held at Milan in 355, the influence of the sovereign being strongly exerted to secure his condemnation. As the resolute patriarch had declared that he would not leave his place without an express order from the emperor, violent means were resorted to for his expulsion. While engaged in conducting divine service, he was interrupted by a company of soldiers, from whom he made his escape into the Egyptian desert. A price was set on his head; and to avoid his persecutors he retired from the usual haunts of the anchorites to a remote desert in upper Egypt, where he was attended by one faithful follower. Here he wrote several works to confirm orthodox Christians in their faith. On the accession of Julian to the imperial throne, toleration was proclaimed to all religions, and A. returned to his former position as Patriarch of Alexandria (361). His next controversy was with the heathen subjects of Julian, to whom the patriarch, by his zeal in opposing their religion, had made himself very offensive. To save his life, he was compelled again to flee from Alexandria, and remained concealed in the Theban desert until 363, when Jovian ascended the throne. After holding office again as patriarch for only a short space of time, he was expelled anew by the Arians, under the emperor Valens. A. now found refuge in the tomb of his father, where he remained hidden four months, until Valens, moved by petitions from the orthodox Alexandrians, restored the patriarch to his see; in which he continued till his death.

A. was the leading ecclesiastic in a most trying period of the early church. His ability, his conscientiousness, his persistency, his fearlessness in the storms of opposition, his activity and patience, all mark him as an extraordinary man. Though twenty years of his life were spent either in exile, or its equivalent, yet his steadfastness, combined with the support of a large party, gave him finally the victory. He was a clear thinker; and as a speaker, was distinguished for extemporaneous precision, force, and persuasiveness.

His writings are polemical, historical, and moral; all marked by a style simple, cogent, and clear. The polemical works treat chiefly of the doctrines of the Trinity, the incarnation of the Son of God, and the divinity of the Holy Spirit.

The earliest edition of the collected works of A. in the original Greek appeared in two vols., folio, Heidelberg, 1600. Better is the great edition by Montfaucon (1698); and the recent standard edition in the library of the Fathers

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by the Abbé Migne (1860). A.'s Four Orations against the Arians, and his Oration against the Gentiles, were translated by Parker (1713); his Treatise on the Incarnation of the Word, by Whiston (1713; another ed., 1880). The Epistles of A. in defense of the Nicene Creed, and on the Councils of Ariminum and Seleucia, together with his first Oration against the Arians, were translated, with notes, by Cardinal Newman (1842). See the church histories by Neander and others; and works on A. by Möhler (2d ed. 1844), and Böhringer (2d ed. 1874).

ATHANOR, n. *āth'a-nawr* [Ger. *athenor*—from Arab. *at-tannūr*: Heb. *tannūr*, a furnace]: a digesting furnace formerly in use among chemists; designed to maintain a regulated amount of heat.

ATHARVANA, n. *a-thār'va na* [Skr.]: the fourth and last of the Indian Vedas. Its language is more modern than that of the other three: see under VEDA (*Atharvaveda*).

ATHEISM, n. *ā'thē-izm* [Gr. *athēōs*, denying the gods—from *a*, without; *thēōs*, a god: F. *athéisme*, atheism]: the disbelief in the existence of God. ATHEIST, n. *ā'thē-ist*, one who does not believe in the existence of God; an infidel, an unbeliever. ATHEISTIC, a. *ā'thē-ist'ik*, pertaining to; or ATHEIS'TICAL, a. *-is'tī-kāl*. ATHEIS'TICALLY, ad. *-kāl-ī*. ATHEIS'TICALNESS, n. the quality of being atheistical. ATHEIZE, v. *ā'thē-iz*, to render atheistic; to speak or write in an atheistic manner. ATHEIZER, n. *ā'thē-ī-zēr*, one who atheizes; one who teaches or encourages atheism. ATHEOUS, a. *ā'thē-ūs*, in OE., atheistic; godless.

A'THEISM: the doctrine of those who deny the existence of God. The term atheist, which conveys terrible associations to many minds, has been so freely applied by the zealous of all ages to those whose notions of the invisible powers differed from their own, that it has lost something of its former force. A little ingenuity serves to make out a case of *constructive* A. from any set of opinions at all differing from the common. Thus, the ancient Greeks accused some of their philosophers of A. though they did not deny the existence of a divinity, but only rejected the common notions of a plurality of gods. And in the Christian Church, after the doctrine of the Trinity had been fixed and defined, those that denied the divinity of Christ were not unusually branded as atheists.

The general revulsion from this name is shown in its earnest repudiation by the adherents of pantheism (q.v.), who reject a personal God, and substitute the idealized principle of order that pervades the universe. It is hardly to be denied, however, that the idea associated with the word God has hitherto involved personality as its very essence; and except for the purpose of avoiding odium, there could be little propriety in retaining the word when the notion is so completely altered.

The view of those who, like Kant, believe it impossible to *demonstrate* satisfactorily the existence of God, though the divine existence must be held on other grounds, is called *speculative* A., in opposition to the *dogmatic* A. of those who attempt to disprove that existence.

ATHELING—ATHENÆUS.

ATHELING, n. *ǣth'el-ing* [AS. *athel*, noble; *ing*, son of]: in *OE.*, one of noble or royal descent; the royal heir-apparent.

ATH'ELNEY, ISLE OF: a marsh at the junction of the rivers Tone and Parret, in the middle of Somersetshire. Here Alfred, when driven from his throne, hid from his enemies, and founded, in 888, a Benedictine abbey, now entirely gone. Among the many relics found in this spot is a ring of Alfred's, preserved in the Oxford Museum. The name Athelney means 'island of the nobles,' or 'royal island.'

ATHELSTAN, *ǣth'el-stǣn*, Saxon monarch who first took the title King of England: abt. 895-941, Oct. 25; grandson of Alfred the Great. Alfred had assumed the title only of King of the Anglo-Saxons. Athelstan was crowned at Kingston-upon-Thames, 925, and seems to have had ambition and talent. It is supposed that his design was to unite in subjection to his single sway the entire island of Britain. His resources, however, were not equal to the undertaking, and he had to content himself with the acquisition of portions of Cornwall and Wales. On the death of Sigtric, King of Northumbria, who had married one of his daughters, A. took possession of his dominions. This excited the alarm and animosity of the neighboring states, and a league, composed of Welsh, Scotch, and Irish, was formed against the English king, for the purpose of placing Aulaff, the son of Sigtric, on his father's throne. A fierce and decisive battle was fought at Brunenburgh, in which the allies were utterly defeated, and which became famous in Saxon song. After this, the reputation of A. spread to the continent. His sisters were married into the royal families of France and Germany, and he had great influence and consideration. At home, he showed deep interest in the welfare of his people, improved the laws, built monasteries, and encouraged the translation of the Bible into the vernacular. He died at Gloucester.

ATHENÆUS, *ǣth-a-nē'ūs*: a Greek *rhetor* and *littérateur*, at the close of the 2d and beginning of the 3d c.; b. Naucratis, Egypt. His work, entitled *Deipnosophistæ* (Banquet of the Learned) in fifteen books, but of which remain only the first two, and parts of the third, eleventh, and fifteenth in an abridged form, is very interesting, as it preserves copious fragments of old writers, and treats, in the form of dialogue, of almost all the topics of ancient Greek manners, private and public life, arts, sciences, etc. The work is not indicative of genius or of high ability; the author, for the most part, appears in the character of an agreeable, well-read, epicurean gentleman, excessively fond of *tid-bits*, both of scandal and cookery. He tells many stories to the disadvantage of people whom history praises; but these we are by no means bound to believe, nor, indeed, is he a man whose opinions are worth much on any subject, but as a melange of literary, social, and domestic gossip, the value of the work is unrivalled. A. appears to have read enormously; he states that he had made extracts from 800 plays of the middle comedy alone;

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but his dialogue is prolix and lumbering. The best editions are by Schweighäuser (14 vols. 1807), Dindorf (3 vols. 1827), Meineke (4 vols. 1867). There is an English translation of A. (3 vols. in Bohn's series, 1854).

ATHENAGORAS, *ăth-ĕ-năg'ō-ras*: Christian philosopher in the 2d c., who taught first at Athens, afterwards at Alexandria. He is one of the oldest of the apologetical writers, and is favorably known by his *Legatio pro Christianis*, which he addressed to the emperor Marcus Aurelius, 177. He therein defended the Christians against the monstrous accusations of the heathen, viz., that they were guilty of atheism, incest, and cannibalism. His work is written in a philosophical spirit, and is marked by great clearness and cogency of style. There remains also a valuable treatise of A. on the resurrection of the dead.

ATHENAIS *ăth-ĕ-nă'-is*: b. Athens abt. the end of the 4th c.; d. 460; dau. of Leontinos the Sophist. She received from her father a superior education, being skilled in Greek and Latin literature, rhetoric, astronomy, geometry and the science of arithmetic. After his death she went to Constantinople, to obtain justice for the harsh treatment to which her brother subjected her. Here her beauty and intelligence made her the favorite of Augusta Pulcheria, sister of Theodosius II., who considered that she would make an excellent wife for the emperor. In 421, A., having been baptized and named Eudocia, was married to Theodosius, and in 438, made a splendid pilgrimage to Jerusalem, bringing with her, on her return, the supposed relics of the first martyr, Stephen. Afterwards, she lost the favor of Pulcheria—the real manager of affairs—and was banished from the court, retiring to Jerusalem, where she suffered many persecutions, and died, in the odor of sanctity. A. wrote an epic poem on the war of Theodosius against the Persians, and several other metrical works, which have not been preserved.

ATHENE, or ATHENA: see MINERVA.

ATHENEUM, or ATHENÆUM, n. *ăth'ĕ-nĕ'ŭm* [Gr. *Athenaion*, the temple of Minerva at Athens; *Athēnē*, the goddess Minerva]: a public reading or lecture room. The A. at Athens was frequented by poets, learned men, and rhetoricians, who there read aloud their works.—The A. in Rome was a school or college erected, by the emperor Hadrian, for the study of poetry and rhetoric, with a regular staff of professors. It existed for a long period. In the time of Theodosius II., it had three professors of oratory, ten of grammar, five of sophistry or dialectics, one of philosophy, and two of jurisprudence.—In modern times, the name A. has been revived as an appellation for certain literary institutions, and also as a collective title for literary essays and reviews. A. is the title of two weekly journals of literature, science, and art—one published in London, the other in Paris.

ATHENIAN, a. *ă-thĕ'nĭ-an*: of Athens; N. an inhabitant of Athens.

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ATHENS, *ăth'ĕnz*: cap. of the ancient state of Attica; said to have been founded by Cecrops, about B.C. 1500, and styled Cecropia; but even the ancients themselves doubted this tradition. Equally uncertain is the story that it was first styled A., in honor of Athene, during the reign of Erichthonius. The ancient citadel was situated on a square craggy rock, 513 ft. high, with a flat summit 1,000 ft. long, and 500 broad. Gradually, as population increased, A. extended over the wide and beautiful plain below. This increase is said to have been due to the organization of the twelve Attic tribes into a political confederacy or union by Theseus, the brightest figure in the 'dark ages' of Attic history. The position of A. near the Gulf of Saronica, opposite the eastern coast of the Peloponnesus, was favorable to the acquirement of naval power. The city, four or five miles from the sea, had three harbors, all situated on the s.w. side, and connected with it by walls. The oldest of these harbors was Phalerum, the nearest to the city, and accessible at all times by a dry road. The Piræus was used as a harbor first by Themistocles. Munychia was the Acropolis of the whole rocky peninsula termed the Piræus, and of immense importance strategically. The last two harbors were connected with the city by the famous 'long walls,' of which we read so much in Athenian history. They were forty stadia, or nearly five m. in length. Two streams flowed in the vicinity of A.; on the e. side, the Ilissus, which also washed the s. part of the city; and on the w., the Cephissus, about a mile and a half beyond the walls. To the w. lay Salamis, with Eleusis on the n.w., Phylæ and Decelea on the n., Marathon on the n.e., and Hymettus on the s. All along the coast were splendid buildings.

The whole of the magnificent prospect was crowned by the Acropolis, where all the most glorious monuments of A. were assembled. First rose the Parthenon (q.v.), or Temple of Minerva, a pile which even now, after the lapse of centuries, remains among the wonders of the world. The Propylæa, all built of white marble, formed the entrance to the Parthenon. Close to it, on the n. side of the Acropolis, rose the Erechtheium, the most venerated of all Athenian sanctuaries, and connected with the oldest religious history of the city. The whole of it was destroyed by the Persians, but was restored during the Peloponnesian war. Its ruins still exist, and give a correct idea of the external form and structure. In some points it differed from all other Greek temples. It is sufficient to say, of the many magnificent buildings which were the glory of ancient Athens, that gods were never more superbly honored in any land. The enthusiastic love of the beautiful which animated the Athenians, turning their religion into an art, and making worship an education in æsthetics, is nowhere so clearly visible as in their religious architecture. Their mythological faith stood daily before their eyes in monumental splendor, for almost every deity had his temple or shrine in the city. Two of the finest buildings—the Temple of Theseus, and that of Jupiter Olym-

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pus—were on the outside of the city; the first to the n.w., and the second to the s. The former, built about B.C. 465, therefore older than the Parthenon, was both a temple and a tomb, inasmuch as it held the remains of Theseus himself. It had the privilege of an asylum for slaves, and the large space of ground which it inclosed was frequently used as a muster-ground for the Athenian soldiery. It was built of the favorite Pentelic marble, in the Doric style of architecture, and is the best preserved of all the monuments of ancient Athens. For centuries it was a Christian church, appropriately dedicated to St. George, the chivalrous hero of the 'dark ages' of Christianity, as Theseus had been of the 'dark ages' of the Attic history; but is now the national museum of the city. The Temple of Jupiter, of which fifteen grand Corinthian columns are still extant, to the s.e. of the Acropolis, and near the right bank of the Ilissus, in size, splendor, and beauty excelled all other Athenian structures. Immense sums of money were expended upon it from the time when it was commenced by Peisistratus, until it was completed by Hadrian, a period of 700 years. The building of it was frequently suspended, so that Philostratus calls it 'a struggle with time.' At the time the Persians sacked the city, it was fortunately only beginning to be built, and so escaped destruction. Aristotle speaks of it as a work of despotic grandeur, and equal to the Pyramids of Egypt. The exterior was decorated by about 120 fluted columns, 61 ft. in height, and more than 6 ft. in diameter. It was 354 ft. long, and 171 broad, and contained the celebrated statue of the Olympian Jupiter in ivory and gold, the work of Phidias.

Besides these wonders of art, the city contained places of interest of which the memory will perpetually remain—the Academy where Plato, whose estate lay near it, gave his lessons in a grove of plane-trees adorned with statues; tradition alleged it to have belonged originally to Academus. Hipparchus surrounded it with a wall, and Cimon adorned it with walks, fountains, and olive-groves. The Lyceum, most important of the Athenian gymnasia, where Aristotle lectured; and, near to this, the Cynosarges, where Antisthenes the Cynic expounded his 'harsh and crabbed' doctrine; the hill of the Areopagus, where the most venerable court of judicature was held; and the Prytaneum, or senate-house. About a quarter of a mile to the w. of the Acropolis is a low hill, which marks the locality of the Pnyx, a place of public assembly, forming a large semicircular area, bounded at the base by a limestone wall, from which projects a pedestal, carved out of the rock, and ascended by steps. This most interesting place has been preserved almost in its integrity, and, as we look around, we are carried back to the times when some six thousand Athenian citizens were here assembled, when the orator, standing upon the pedestal, could survey the Acropolis, with all its temples, the venerable Areopagus, and beyond the city, the extended plains and villages of Attica, with corn-fields, olive grounds, and vineyards.

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A., in its most flourishing period, numbered 21,000 free citizens; from which we may calculate that it contained about 200,000 inhabitants. More than two thousand years have passed over the beautiful city, and still its remains excite the admiration of the world. The Turks surrounded it with wide irregular walls, partly built out of the ruins of the old walls, and containing many fragments of noble columns. Of the Propylæa, the right wing, or Temple of Victory, was destroyed in 1656 by the explosion of a powder-magazine. Six columns, with lofty arches, remain to mark the site of the opposite wing. The interior of the Parthenon was used for some time as a Turkish mosque. Eight columns remain on the e. of the front, several colonnades at the sides; and of the back pediment, where the combat of Minerva and Neptune was sculptured, nothing remains save the head of a sea-horse, and two decapitated female figures. Of the pediment in front, several figures belonging to the group representing the birth of Minerva are preserved in the British Museum, and justly regarded as masterpieces of ancient sculpture. Of all the statues which the Parthenon contained, only one, that of Hadrian, has been preserved. Ruined as it has been, the general aspect of the Parthenon is still sublime. Of the Erechtheium (or Temple of Neptunus Erechtheius) there are considerable remains, especially the beautiful female figures styled Caryatides.

The situations and vast extent of the two theatres may still be traced, though grain is now grown in the arenas. All these remains belong to the Acropolis. In the city below, there are no such splendid memorials. The Horologium, or octagonal Temple of the Winds (built by Andronicus Kyrrestes), has been well preserved; but a few fragments found in broken walls are all that remain to tell of the splendid Gymnasium built by Ptolemæus. Beyond the city, the attention of the spectator is arrested by the sublime ruins of the Temple of Jupiter Olympus. Pedestals and inscriptions have been found here and there, sometimes buried in the earth. The sculptures on the friezes of the interior of the Temple of Theseus, representing the exploits of Theseus, have been well preserved, while the external sculptures are almost utterly destroyed. A Turkish burial-place now occupies the hill where the Areopagus held its sittings. The site of the Lyceum is indicated only by scattered stones, and a modern house and garden occupy the place of the Academy. Scarcely anything remains to show the old magnificence of the harbors Piræus, Phaleros, and Munychia.

It is probable that, in the time of Pausanias, many structures remained belonging to the period before the Persian war, as Xerxes, during his short time of mastery over A., would scarcely have been able to destroy more than the fortifications and principal public buildings. Themistocles, in his restoration of the city, had chiefly a regard to utility; Cimon paid attention to its decoration; but Pericles far exceeded them in the magnificence of his designs, which were too vast to be carried into effect in later times. The

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civilization, spreading from A. as its centre, raised Macedon and other states into dangerous rivalry. The defeat at Chæroneia was as fatal to the fine arts as to the liberty of the Athenians. After the works at the Piræus had been destroyed by Sulla, the naval power, and with it the whole political importance of A., rapidly declined. It is true that the city was treated leniently by its conquerors; the temples and statues were preserved from violation, and A., with all the trophies of eight centuries of greatness, remained under the Antonines; but the free national spirit of the Athenians had departed for ever, and slowly, but surely, the fine arts shared the fate of Grecian liberty. Their treasures, which had been spared by the Roman emperors, were gradually stolen away by various thievish collectors, especially for the decoration of Byzantium, or were destroyed by unthinking Christian zeal and barbarian invasion. About A.D. 420, the ancient religion and temple-service of A. had entirely disappeared; afterwards, the schools of philosophy were closed by Justinian, and Greek mythology was gradually forgotten. St. George took the place of Theseus, and the Parthenon was converted into a church. The surviving industry of A. was injured by Roger of Sicily, who removed its silk manufactures. In 1456, A. fell into the hands of Omar, and, to consummate its degradation, under the low, sensual Turks, the city of Athene was regarded as an appanage of the harem, and governed by a black eunuch. The Venetians, having captured the city in 1687, intended to carry away as a trophy the quadriga of victory from the w. front of the Parthenon, but shattered it in their attempt to remove it. In 1688, A. was again delivered into the hands of the Turks, and the work of demolition now proceeded rapidly. The grand remains of antiquity were used as quarries to supply materials for all ordinary buildings, and, in the course of another century, the city was reduced to its lowest point of degradation.

Modern A. (styled by the Turks *Athina* or *Setines*) is now the capital of the new kingdom of Greece. Previous to the Greek revolution (1821), it was a provincial city of inferior importance, the seat of a Greek metropolitan bishop, and under the jurisdiction of the Turkish governor in Eubœa. In 1821, the war of liberation commenced, and the Turks surrendered Athens in the following year; but again captured it in 1826, and took the Acropolis in 1827. After this it was left in ruins until 1830, when Attica was declared united with Greece by the protocol of the London Conference. In 1834, Otho, the son of the Bavarian monarch, who had been elected to the sovereignty of the new kingdom, removed his residence from Nauplia to A. Improvements now proceeded rapidly: Turkish manners and customs disappeared; the contemptible wooden houses and crooked streets were superseded by new ones—among which the *Hermes*, *Æolus*, *Athene*, and *New Stadion* streets are conspicuous; and, in 1836, the foundation of a new palace was laid, completed in 1843. The municipal affairs of A. are now regulated by a mayor (*demarchos*) and council elected by the citizens. Modern A. has a gymnasium, a

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library enriched with many donations from France and Germany, and a university, where about 52 professors and tutors are engaged. The number of students is about twelve hundred. Much literature is published here. The French and United States governments have each founded an Archæological Institute in the city. A. has soap-works, leather-works, and silk and cotton factories. It is connected with Piræus (q.v.), its port, by rail. Pop. (1896) 111,486.

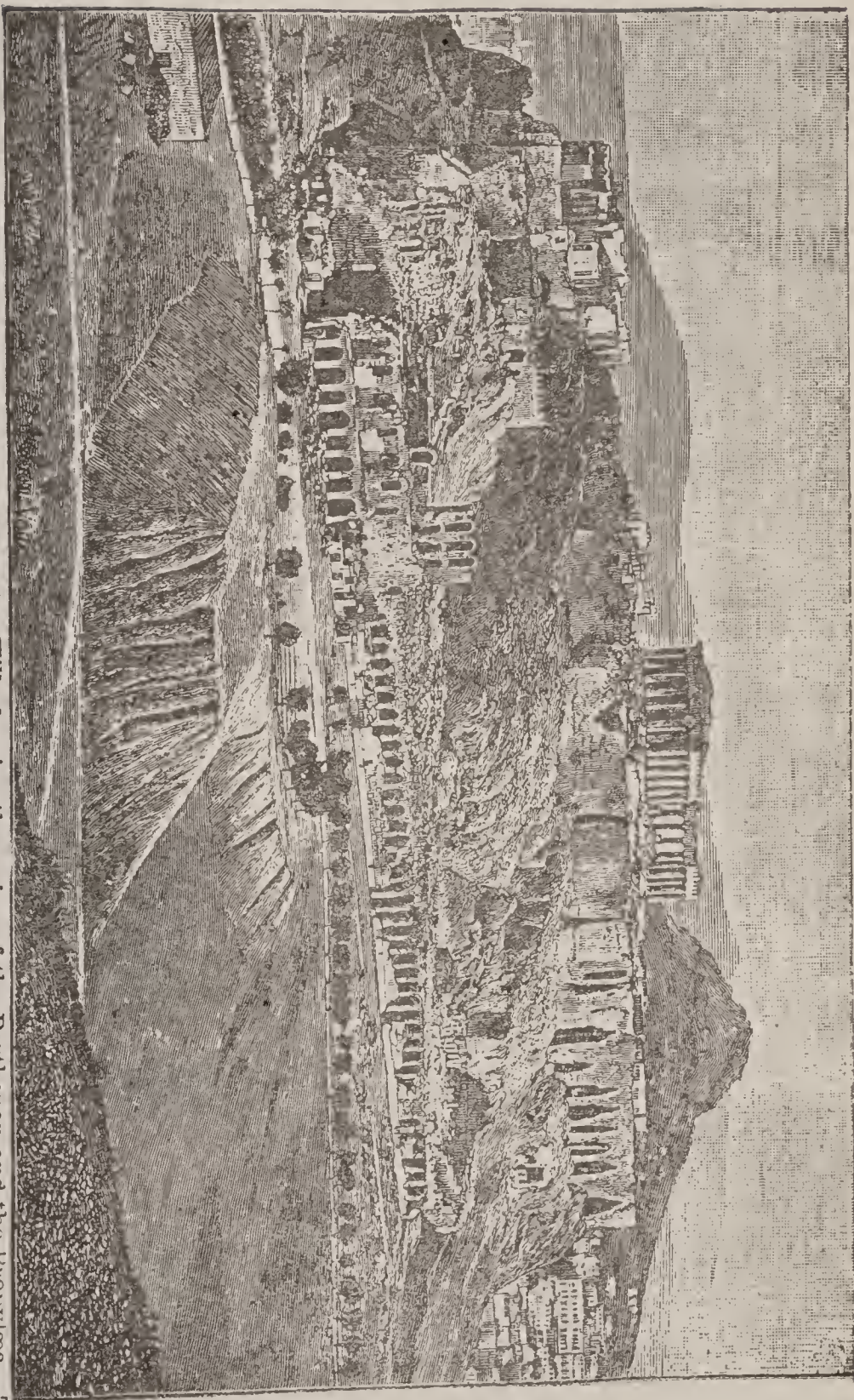
Political History of A.—It was the Ionic race that manifested most signally the distinguishing characters of Greek civilization; and of this portion of Hellas, A., in the brilliant part of its history, stands out most prominently. According to tradition, its political power was first established by Theseus, King of Attica, who made A. the metropolis. Here he instituted the great popular festival of the Panathenæa, and, by encouraging settlements in the city, greatly increased its population. He divided the citizens into three classes: nobility, agriculturists, and mechanics. Until the death of Codrus, B.C. 1068, A. was governed by kings; afterwards, by archons elected from the nobility. The time of holding office was limited to ten years, B.C. 752, and to one year B.C. 683, when nine archons were annually elected, one being called the *archon eponymus*, because the year was distinguished by his name. Here begins the authentic history of A. These archons, together with the council of nobles, afterwards called the Areopagus, exercised the whole power of the state, and administered justice. The Athenian government was thus, like all other Hellenic governments, an oligarchy; but the changes introduced by the archon Solon, B.C. 594, though remarkably moderate, laid the foundation of that democratic constitution which was perfected by Cleisthenes. The condition of the population at the time of Solon was one of extreme suffering and discord, arising chiefly from the oppressive execution, by the aristocratic archons, of the law of debtor and creditor. This law was of old extremely harsh in Greece as well as in Rome; it assigned the debtor that could not fulfil his contract as the slave of his creditor. The great part of the soil of Attica was in the hands of the rich, and the mass of the population, who tilled the lands as tenants, were either in hopeless arrears, or already, with their families, actual slaves. Driven to desperation, the populace were ready to rise in mutiny; the oligarchy were afraid or unable to enforce the laws; and thus it was agreed to confer dictatorial power on Solon, well known for his wisdom, integrity, and sympathy with the people, and allow him to solve the problem. The disease being desperate, Solon applied the desperate remedy of abolishing existing contracts, liberating those that had been reduced to slavery, and forbidding for the future any one from pledging his own person or that of a member of his family. He next reformed the political constitution by dividing the freemen into four classes, according to the amount of their property. It was only the richer classes that paid taxes and were eligible to the offices of state; but all had votes in the assembly that elected the archons,

ATHENS.

and all sat in judgment on their past conduct, on the expiry of their year of office. The government, though still oligarchical, was thus modified in the direction of democracy by popular control. Its free operation was for some time (B.C. 560-510) interrupted by the usurpation of Peisistratus and his sons, whose *tyranny*, however, was mild and enlightened, the forms at least of the Solonian constitution being preserved.

On the banishment of the Peisistratidæ (B.C. 510), a further political reform was introduced by Cleisthenes, who extended the basis of the constitution, and rendered it essentially democratic. To Cleisthenes is ascribed the origin of the practice called *ostracism* (q.v.).

Then followed the brilliant period of the Persian war, when out of the circumstances which had seemed to threaten destruction, A. rose to the highest point of power and prosperity. Miltiades at Marathon, and Themistocles at Salamis, gained the victories which infused new courage and enthusiasm into the Greek nation. The period between the Persian war and the time of Alexander the Great, B.C. 500-336, was the most glorious in Athenian history; and in 444, Cimon and Pericles raised the city to its highest point of grandeur and beauty. But under Pericles, the beginning of a decline took place, through the decay of ancient morals and the Peloponnesian war, which ended in the capture of A. by the Lacedæmonians. After this, A. retained only the shadow of its former power and dignity. The thirty appointed ministers of government were, in fact, so many tyrants, supported by the Lacedæmonian army. After eight months of despotism had been endured, the tyrants were expelled by Thrasybulus, a free constitution was restored to A., and a new period of prosperity commenced. But it did not long endure; a formidable foe, Philip of Macedon, appeared in the north. The Athenians having opposed him in the Phocian war, Philip took from them several of their colonies. Then followed the defeat of the Athenians at Charoneia (B.C. 338), a fatal blow. A. with other states became subject to Macedon. The free spirit of the citizens was broken, and they degenerated in moral character. After Alexander's death, a fruitless attempt was made to regain their liberty. Antipater instituted an oligarchy of wealth. Soon afterwards, A. was taken by Cassander, and placed under the rule of Demetrius Phalereus, who employed his power wisely and beneficently. Once more the old constitution of A. was restored by Demetrius Poliorcetes, and a short interval of independence was enjoyed, until the city was taken by Antigonus Gonatas. After liberating themselves from the dominion of Macedon, and joining the Achaian confederacy, the Athenians were so misguided as to support Mithridates against the Romans. This last error was fatal. Sulla conquered A., destroyed the port of the Piræus, and left only the appearance of liberty and independence, which entirely vanished in the time of Vespasian. Still, after the spirit of liberty and progress had departed, A. long remained safe from spoliation. The Romans, in their



Athens.—View of the Acropolis from the Mouseion Hill, showing the ruins of the Parthenon and the Propylaea. The arches belong to the Odeum of Herod and other buildings of the Roman period. The hill to the right is Lycabettus.

ATHENS—ATHEROMA.

respect for Grecian pre-eminence in art and philosophy, moved also by religious reverence, long regarded Athens as a captive too noble and beautiful to suffer any indignity.

ATHENS: city of Clarke co., Ga., on the Oconee river, 135 m. n.e. of Atlanta by the Athens branch of the Georgia railroad. It has considerable cotton trade, receiving annually about 35,000 bales, 6,000 of which are consumed by the local manufactories. It has two national banks, three weekly papers, eleven churches, and is the seat of the Univ. of Georgia and the Lucy Cubb Institute. The university is non-sectarian, with agricultural, mechanical, legal, and medical departments, and has four branch agricultural colleges in different parts of the state. The Franklin College, State College, and Law School are at A. Pop. (1890) 8,627; (1900) 10,245.

ATHENS, AMERICAN SCHOOL AT: an institution for classical study in Athens, Greece. It was founded in 1882; is a branch of the Archæological Institute of America; and is managed by a committee representing the various colleges in the U. S. which contribute to its support. The building, which was erected by means of private subscriptions, is built on grounds donated by the Greek Government, and the institution has an endowment of \$50,000. The students are not only engaged in studying the remains of Greek civilization, but the fruitful excavations at Eretria and Argos.

ATHERINE, *ăth'ĕ-rĭn* (*Atheri'na*): genus of small fishes, allied to the Mullet family (*Mugilidæ*), but latterly separated into a distinct family, *Atherinidæ*. The Atherines have more than twice as many vertebræ as the Mulletts; they are of a rather slender form, but few of them exceed six inches in length. They have a protractile mouth, and very small teeth; some are quite toothless. Almost all the known species, which are numerous, and found in the seas of different parts of the world, have a broad silvery band along each flank. Some of them are much esteemed for their delicacy. They all congregate in great shoals. They abound in the Mediterranean. One species, *A. Presbyter*, is very common on the s. coast of England and on some parts of the coast of Ireland, but is rare on the e. coast of Britain. In the markets of some of the southern towns of England, where the Smelt (q.v.) is unknown, it is sold under that name: in the United States are a few species of the family.

ATHERMANCY, n. *a-thĕr'man-cĭ* [Gr. *athermantos*, not heated—from *athermos*, without heat—from *a*, without; *thermos*, hot]: term used by Melloni to express the power which certain bodies have of stopping radiant heat. ATHER'MANOUS, pertaining or relating to athermanancy.

ATHEROMA, n. *ăth'ĕ-rō'mă* [Gr. or L. *atherōma*, a tumor filled with matter]: a form of fatty degeneration; a curdy tumor. A., or 'fatty deposit,' is generally found in the tissues of aged persons, or those who have lived dissipated and ill-nourished lives. In appearance, it is yellow and cheesy, showing under the microscope fatty granules and crystals of cholesterine. Its most common

ATHEROSPERMA—ATHLETE.

situation is between the middle and inner coats of arteries, and is dangerous, inasmuch as it interferes with the elasticity of the arterial tube, rendering it more liable to injury, and less able to repair itself, should any occur. A. generally precedes aneurism (q.v.). See ARTERIES, DISEASES OF. Cysts filled with contents resembling bread-sauce, which frequently occur in the scalp, are termed atheromatous tumors. ATHEROMATOUS, a. *ăth'ěr-ôm'ă-tūs*, containing matter of the nature of atheroma.

ATHEROSPERMA, n. *ăth-ěr-ŏ-spēr'ma* [Gr. *ather*, the beard or spike of an ear of corn; *sperma*, seed. So called from the seed being crowned by a permanent hairy style]: genus of plants, the typical one of the order *Atherospermaceæ*.

ATHEROSPERMACEÆ, n. pl. *ăth-ěr-ŏ-spēr-mă'sē-ē* [from the typical genus *atherosperma*]: an order of exogenous plants placed by Lindley in his Menispermal Alliance. Their English name is *plume nutmegs*. They are unisexual plants, having neither calyx nor corolla, but only an involucre. In the male flowers the stamens are numerous; in the female, they are less so. Each involucre has several ovaries, with solitary erect ovules, which afterwards become feathered at the summit by the persistent styles. They are natives of New Holland and South America. In 1846, Lindley estimated the known species at four only.

ATH'ERSTONE: market-town of Warwickshire, England; on the borders of Leicestershire, 16 m. n.e. from Birmingham; on the Roman road called Watling Street. The town is irregularly built; many houses are very ancient. Pop. 4,000.

ATHETOSIS, n. *ăth-ě-tŏ'sīs* [Gr. *athetos*, unfixed, changeable]: disease in which the patient is unable to control the slow and irregular movements of fingers and toes which are due to some spinal or cerebral disturbance. ATHETOID, resembling or pertaining to.

ATHIRST, a. *ă-thěrst'* [AS. *a*, on, and *thirst*]: thirsty; wanting drink.

ATHLETE, n. *ăth'lēt*, plu. ATHLETES, *ăth-lē'tēz*, or *ăth-lētz'* [Gr. *athlētēs*, a wrestler—from *athlos*, a contest]: a wrestler; one who contends in public games in trials of strength. ATHLETIC, a. *ăth-lēt'ik*, pertaining to trials of strength; strong; robust; vigorous. ATHLET'ICALLY, ad. *-kăl-ī*. ATHLETICISM, n. *ăth-lēt'ī-sīzm*, the art of training one as an athlete; the state of being so trained; athletics. ATHLETICS, n. *ăth-lēt'īks*, the art of developing muscular strength for the sake of prize or other contests, or for the ordinary physical work of life. ATHLETISM, n. *ăth'lē-tīzm'*, muscular strength

ATH'LETE: a combatant, pugilist, wrestler, or runner, in ancient Greece. Athletics were studied in Greece as a branch of art, and led to several useful rules of diet, exercise, etc., applicable to ordinary modes of life. Bodily strength and activity were so highly honored by the Greeks, that the A. held a position in society totally different from that of the modern pugilist. When he proposed to enter the lists at the Olympic or other public games, he was examined

ATHLONE—ATHOLE.

with regard to his birth, social position, and moral character. A herald then stepped forth and called upon any one, if he knew aught disgraceful to the candidate, to state it. Even men of genius contended for the palm in athletic exercises. Chrysippus and Cleanthes, the famous philosophers, were victorious athletes, or at least *agonistæ*, i.e. persons who pursued gymnastic exercises, not as a profession, but for the sake of exercise. The profound and eloquent Plato appeared among the wrestlers in the Isthmian games at Corinth, also in the Pythian games at Sicyon. Even the meditative Pythagoras is said to have gained a prize at Elis, and gave instructions for athletic training to Eurymenes, who afterwards gained a prize at the same place. So great was the honor of an Olympian victor, that his native city was regarded as ennobled by his success, and he himself considered sacred. He entered the city through a special breach made in the walls; he was supported at the public expense; and when he died, was honored with a public funeral. Euthymus, of Locri in Italy, who had, with only one exception, been regularly victorious at Elis, was honored with a statue, to which, even during his lifetime, homage was paid by command of an oracle. Athletic sports, first witnessed at Rome B.C. 186, were introduced by M. Fulvius at the end of the Ætolian war, and became excessively popular in the time of the emperors. At Rome, the athletes formed a corporation.

ATHLONE, *ăth-lôn'*: small town in the centre of Ireland, on both sides of the Shannon, chiefly in the county of Westmeath, but partly in that of Roscommon. It is the largest town between Dublin and Galway, and lies on a commanding situation, 3 m. below Lough Ree, in a carboniferous limestone district. The chief manufactures are felt hats, friezes, linens, and stays. A canal here, a mile long, enables large river steamers to navigate the Shannon for 116 m. from Killaloe to Carrick-on-Shannon, uninterrupted by the river rapids. The Shannon is crossed by a fine bowstring and lattice iron bridge of two arches, 175 and 40 ft. span. Till 1885 A. returned one member to parliament. A. Castle, on the Roscommon bank of the Shannon, founded in the reign of King John, is now one of the chief military positions in Ireland. The fortifications cover 15 acres, and contain barracks for 1,500 men. Pop. of A. 6,755.

ATHOL, *ăth'ŭl*: post village in Worcester co., Mass.: on Miller's river, from which great water-power is obtained. It is 70 m. w.n.w. of Boston, 28 m. n.w. from Worcester, 48 m. n.e. from Springfield; at the junction of the Boston and Albany and the Fitchburg railroads. It has three banks, two being national and one savings, and publishes two weekly papers. There are considerable manufactories of boots, shoes, woollens, etc. Pop. (1870) 3,517; (1880) 4,307; (1890) 6,319; (1900) 7,061.

ATHOLE, *ă'thŭl* [Pleasant Land]: a dist. of 450 sq. m., in the n. of Perthshire, occupying a great part of the s. slopes of the Grampian Mountains, and intersected by

ATHOR—ATHOS.

many narrow glens, down which flow the rapid tributaries of the Tay. It is chiefly composed of gneiss and quartz rock, with beds of primary limestone. Dr. Hutton's explorations among the granite veins in Glen Tilt were among the chief means of establishing the Plutonic theory of geology. A. was once one of the best hunting districts in Scotland. Athole deer-forest is said to contain 100,000 acres, and 10,000 head of deer, of which 100 are killed annually. In the picturesque Pass of Killiecrankie, in this district, 17 m. n.w. of Dunkeld, Claverhouse fell in 1689, though victorious over the troops of King William III.

A'THOR, or ATHYR, but properly, *Het-her*, i.e., 'the habitation of God': an Egyptian goddess who, in the mythological system of that people, is ranked among the second class of deities. She was the daughter of Ra, the sun. By the Greeks, she was identified with Aphrodite (Venus). The cow was regarded as her symbol, and in hieroglyphics she generally appears with the head of that animal bearing between her horns the figure of the sun's disk. A. is also represented as a cow itself, and as a bird with human face, horns, and the sun's disk. On the oldest monuments, she is frequently portrayed bearing a temple on her head, as in the Athor-capitals of the Ptolemaic buildings, falsely supposed to be heads of Isis. Originally, the goddess had a cosmogonic significance; later, she was called the 'mistress of dance and jest,' and held in her hands, as symbols of joy, the cord of love and the tambourine. Queens and princesses were often represented by the figure of A. Her worship was general in Egypt. Her most sacred abode was at Denderah. After her the third month of the Egyptian year was named.

ATHOS, *àth'òs*, ΠΑ'GION O'ROS, or MON'TÉ SAN'TO, i.e., the Holy Hill: the principal mountain of a chain extending in a peninsular form, from the coast of Macedonia into the Ægean Sea, between the gulfs of Contessa and Monté Santo, and connected with the mainland by a narrow isthmus. The length of the peninsula is 40 m.; breadth, 4 m. According to tradition, it received its name from A., son of Neptune, or from A., a giant who battled against the gods. The highest summit in the chain, or Mount A. proper, a solitary peak at the s. extremity of the peninsula, rises 6,350 ft. above the sea. In ancient times, several towns were built on A. Herodotus mentions five. The most memorable thing in connection with A. is the canal which Xerxes cut through the isthmus, in order to escape the stormy gales which rendered the navigation round the promontory very perilous, and which had shattered the fleet of Mardonius some years before. Traces of this canal still exist. In the middle ages, A. was covered with monasteries, of which 20 remain (besides several hermitages, chapels, etc.). The largest are the monasteries of Ivoron and St. Laura; the richest, Vatopædi. The entire number of monks who inhabit the 'Holy Hill' is about 8,000. They form a kind of monastic republic

ATHRIXIA—ATITLAN.

under the Turkish government, to which they pay an annual tribute of nearly \$20,000. The monks follow the rule of St. Basil, and lead an ascetic life, engaged chiefly in agriculture, gardening, and the care of bees. In diet, they restrict themselves to herbs, fruits, and fish. They carry on a considerable trade in amulets, images, crucifixes, wooden articles of furniture—all of their own manufacture—and reap profits from the numerous visits of pilgrims. Caryes, the principal place in the peninsula, is picturesquely situated in the midst of vineyards and gardens, and has 1,000 inhabitants. Here the market is held; but no female, even of any animal, is permitted to be present, or even to enter the peninsula. In the middle ages, A. was the centre of Greek learning and Christian-Byzantine art. Now, scarcely more than two or three monks, of moderate education, can be found in a monastery. The libraries are neglected, though containing several beautiful (but not important) old manuscripts.

ATHRIXIA, n. *a-thriks'î-a* [Gr. *athrix*—from *a*, without; *thrix*, hair, in allusion to the absence of hairs from the receptacle and the stigmas of the ray]: genus of plants belonging to the order *Asteraceæ*, or *Compositæ*. *A. capiensis* is a pretty greenhouse shrub, with narrow lanceolate leaves and bright crimson, solitary heads of flowers.

ATHWART, prep. *ă-thwart'* [AS. *a*, on, and *thwart*: *on thirt*, an accommodation of Icel. *um-thvert*, across]: across; from side to side: AD. among *seamen*, across the line of the ship's course; in a manner to cross or perplex; from side to side of a ship, in contradistinction to 'fore and aft.'

ATHY, *a-thî'*: small town in the s.w. of Kildare county, Ireland, on the e. side of the river Barrow, here joined by the Grand canal. It lies in a carboniferous limestone district. Its chief export is grain. Pop. (1881) 4,181.

ATHYMIA, n. *a-thî'mî-a* [Gr. *athumia*—from *athumēō*, to be down-hearted—from *a*, without; *thumos*, the soul as the seat of passion]: faint-heartedness; despondency.

ATHYRIUM, n. *ă-thîr'î-ŭm* [Gr. *a*, without; *thurion*, a little door; a wicket]: genus or sub-genus of ferns.

ATILT, ad. *ă-tîlt'* [AS. *a*, on, and *tîlt*]: in the position of a man making a thrust; in the posture of a barrel raised behind that the liquor may run out.

ATIMY, n. *ăt'î-mî* [Gr. *atimia*, dishonor—from *atimaō*, to dishonor—from *a*, without; *timē*, worship, honor; *tiō*, to pay honor]: in ancient Greece, infamy; public disgrace inflicted on those who had been guilty of certain offenses.

A-TIPTOE, ad. *ă-tîp'tō* [AS. *a*, on, and *tiptoe*]: on tiptoe.

ATITLAN, *ă-tē-tlân'* (or **ATITAN**, *ă-tē-tân'*), LAKE: body of water in the dept. of Solola, Guatemala. It is 24 m. long 8 to 10 m. wide, and a line of 1,800 ft. has obtained no soundings. Several small streams enter it, but it has no visible outlet, and is supposed to occupy the crater of an extinct volcano. Just s. of it are the volcano of A., 12,538

ATKINSON—ATLANTA.

feet high, and the Indian t. Santiago de A. The lake is surrounded by high cliffs devoid of vegetation.

ATKINSON, *ăt' kĭn-son*, EDWARD, LL.D.: political economist: b. Brookline, Mass., 1827, Feb. 10. He received his education chiefly in private schools, and from his youth made a specialty of investigating economic subjects, not only political, but also domestic. He was the founder of the Boston Manufacturers' Mutual Fire Insurance Co., whose members were factory owners, agreeing to run their business on a uniform plan and by established rules. A. gave much study to the subject of railroads, their management and their effect on the movement of population and the conditions of trade; and lectured and wrote extensively concerning them. He informed himself thoroughly also on agricultural subjects, and paid attention to household matters, especially cooking. He invented a style of oven or cooking stove, called the *Aladdin Cooker*, which produced a surprising saving in fuel, and concerning which he lectured, accompanying his lectures with experiments. He interested himself in cooking-schools and charity kitchens. Dr. A. resides in Boston. Among his more important addresses are *Banking*, delivered at Saratoga 1880 before the American Bankers' Assoc.; *Insufficiency of Economic Legislation*, before the American Social Science Assoc.; *What Makes the Rate of Wages*; and an address on the *Application of Science to the Production or Consumption of Food*, before the American Assoc., 1885. Among his pamphlets and books are *Cheap Cotton by Free Labor* (1861); *The Collection of Revenue* (1866); *Our National Domain* (1879); *The Railroads of the United States* (1880); *Cotton Manufactures of the United States* (1880); *The Railway and the Farmer* (1881); *The Distribution of Products* (1885); and *Taxation and Work* (1892). In 1898 he became vice-president of the Anti-Imperialist League and was actively concerned in sending to the troops in the Philippines certain pamphlets which were characterized as 'seditious' by Gen. Otis and were thereupon excluded from the mails.

ATLANTA, *ăt-lăn'ta*: city, cap. of Fulton co., and of the state of Ga.; on the Atlanta and Florida, Atlanta and West Point, Central of Georgia, East Tennessee Virginia and Georgia, Georgia Pacific, Richmond and Danville, Seaport Air Line, and Western and Atlantic railroads; 101 m. n.w. of Macon, 171 m. w. of Augusta, 291 m. s.e. of Nashville; area $9\frac{1}{2}$ sq. m.; popularly known as the 'Gate City.' Its situation is peculiarly advantageous, 1,100 ft. above sea-level, and 7 m. from the Chattahoochie river, a site exceptionally adapted for a great commercial and railroad centre. The city is laid out in a circle 3 m. in diameter, with the Union depot in the centre.—In 1892 it had 50 m. of paved streets (cost \$1,456,000); 50 m. of sewers (cost \$542,000); 147 m. of sidewalk (cost \$463,000); 94 m. of street railways, the greater part electric lines; water-works system (bonded debt \$1,027,000); fire dept. (cost in year \$124,380); police dept. (cost 1891-2 \$158,593); and electric street lights (cost in year \$56,000). The city had income (1891) \$1,550,141.60, (1892) \$2,241,174.78, total

ATLANTA.

\$3,791,312.38; expenditure (1891-2) \$3,423,340.73; balance (1893, Jan. 1) \$367,975.65. In 1896 the estimated net public debt amounted to \$2,956,000, while the assessed valuation of taxable property amounted to \$55,131,197: the combined state, county, and city tax rate was \$1.25 per \$100. The debt 1892 was city bonded \$3,101,000 and water bonded \$1,027,000; total \$4,128,000. There were 2 national banks (cap. \$400,000), 9 state banks (cap. of 8 reporting \$1,750,000), 1 incorporated bank (cap. \$500,000), 1 private bank; 6 loan and investment cos., and 2 fire insurance cos. (cap. \$500,000, assets \$738,182, liabilities \$214,913); and 3 daily, 22 weekly, 1 semi-monthly, and 23 monthly publications.—Of 96 churches the Meth. Episc., S. had 18 for whites and 11 for colored; Bapt. 17 for whites and 19 for colored; Presb. 9 for whites and 2 for colored; Prot. Episc. 7 for whites and 1 for colored; Congl. 4 for whites and 1 for colored; Rom. Cath. 2; and Christian, Lutheran, Adventist, and Unit., 1 each.—There were 19 public school buildings, valued at \$500,000; 10,651 pupils; 134 white and 40 colored teachers; newly established night school; 12 colleges and schools for white pupils and 6 for colored; and educational expenditures \$152,300. Notable educational institutions include the State Technological School (to secure which the city gave \$150,000), North Georgia Female College, Atlanta Medical College, Oglethorpe College, Clark Theol. School (colored Meth.), Atlanta Univ. (colored), two business colleges, an English and German select school, an orphans' free school, Spelman Seminary (Bapt.), Morris Brown College (African Meth. Episc.), and Hebrew Orphan Home.—Its commercial tonnage and revenue during 1892, from New York, Boston, Philadelphia, Baltimore, and Providence, were 78,000,000 and \$455,753 respectively; and from Cairo, Cincinnati, Columbus, E. St. Louis, Evansville, Henderson, Lexington, Louisville, Memphis, and Nashville 339,000,000 and \$943,873 respectively. An official report on the manufactures of the city 1891 showed: 633 plants, \$16,190,000 capital, 15,208 hands, \$33,012,000 value of products; increase since 1880: 437 plants, \$13,721,544 capital, 11,528 hands, \$28,012,000 value of products. Principal industries, according to capital employed, were, manufacture of foundry products, 25 plants, \$3,250,000 capital, 3,150 hands, \$6,150,000 value of products; cotton goods, 3 plants, \$1,400,000 capital, 1,100 hands, \$1,500,000 products; lumber, 30 plants, \$1,250,000 capital, 300 hands, \$1,500,000 products; fertilizers, 7 plants, \$1,250,000 capital, 300 hands, \$1,500,000 products; cotton-seed oil and cake, 4 plants, \$950,000 capital, 550 hands, \$1,250,000 products; brick, 12 plants, \$925,000 capital, 725 hands, \$1,800,000 products; furniture, 9 plants, \$725,000 capital, 750 hands, \$2,000,000 products; bags, paper, etc., 3 plants, \$350,000 capital, 500 hands, \$850,000 products, etc. According to the census of 1900 A. had 395 manufacturing establishments, employing \$16,085,114 capital, and yielding products of an aggregate value of \$16,721,899.—The monument to Henry W. Grady, the hospital erected as a memorial to him by popular subscription at a cost of about \$100,000, the Forsythest. bridge (building at a cost of \$130,000), the park presented

ATLANTES—ATLANTIC CITY.

to the city by L. P. Grant and named after him, and the extensive U. S. milit. post that the general govt. has established, are among recent local attractions.—Other buildings of note are the capitol, of white marble, cost nearly \$2,000,000, the U. S. Custom-house and Post-office, new county court-house; chamber of commerce, Y. M. C. A. building, the Equitable Building, completed 1892 at cost of \$1,000,000, and the new Kimball House, completed 1885.—The founding of the city was due to its selection as the point of departure for branch roads to Athens, Milledgeville, Columbus, and other cities, from the main line of railroad (the Western and Atlantic) between A. and Chattanooga. It was surveyed and laid out 1844–5, named first Terminus, afterward Marthasville, and 1847, when incorporated, Atlanta. The first building in A. was a log hut, 1836; the first store was opened 1843; in the same year the first locomotive ran over the new railroad, and until 1864 its growth was continuous. In that year Gen. Sherman, in his famous march to the sea, occupied Atlanta, the inhabitants fled, and the city was occupied by Union soldiers. The occupation lasted until Nov., when the army departing left a mass of smoking ruins. The return of the inhabitants to their devastated homes was the beginning of a wonderful progress. As a notable historical fact, it may be stated that a factory in A. which, during the war, was used for manufacture of swords and bayonets, was afterward turned into a plow-factory.—Pop. (1880) 37,409; (1890) 65,533—of which native born 63,662, foreign born 1,871, colored 28,117; (1900) 89,872. See COTTON-STATES EXPOSITION.

ATLANTES, *ăt-lăn'tēz*: so called by the Greeks in reference to the mythical Atlas (q.v.): male figures used instead of columns. The Romans called them Telamones.

ATLANTIC, a. *ăt-lăn'tik*, of or pertaining to the ocean so named.

ATLANTIC: city, cap. Cass co., Iowa, on the Chicago Rock Island and Pacific r.r., 60 m. e. of Omaha. Notable buildings are the court-house and the high-school; teachers in schools 20, enrolment 1,100. The Holly system supplies water. Manufacturing establishments: pork-packing house, starch factory, cannery of vegetable products. Banks: 1 national, cap. \$50,000; 1 state, cap. \$60,000, undivided profits \$15,000; 3 private banks. Newspapers: 1 daily, 3 weekly. Pop. (1900) 5,046.

ATLANTIC CITY, *ăt-lăn'tik*: popular seaside resort in Atlantic co., N. J., 60 m. s.w. of Philadelphia, and 146 m. from New York; on Absecon Beach on a sandy island, 10 m. in length, and abt. $\frac{3}{4}$ m. in width, which extends between Absecon Inlet and Great Egg Harbor Inlet, and is separated by a narrow strait from the mainland. The beach is considered one of the best and safest on the coast, and the locality is the favorite resort of the citizens of Philadelphia, besides drawing thousands from all parts of the country during the height of the season. The city is prettily laid out with broad and pleasant avenues. Pop. of city (1890) 13,055; (1900) 27,838.

ATLANTIC OCEAN.

ATLANTIC OCEAN: so called either from Mount Atlas, or from the fabulous island of Atlantis: that part of the ocean that divides the old world from the new. Its extreme breadth is about 5,000 m., and its narrowest part, between Cape St. Roque in Brazil, and the nearest point in Africa, about 1,600 m. If the A. be supposed to be bounded by the polar circles, and to include the Caribbean Sea, Hudson Bay, Mediterranean Sea, and the other connected water-surfaces, it covers an area computed at 35 million sq. m. The A. is naturally divided into three portions—the n., s., and intertropical A. It has open connection with the n. and s. polar seas; and in the remarkable parallelism of its coasts, resembles rather a vast river than an ocean. Its n. half sends off numerous ramifications on both sides, some of them forming almost shut seas: on the w., Hudson's Bay, the Gulf of St. Lawrence, and the Gulf of Mexico; on the e., the Baltic, North, Mediterranean, and Black Seas. In the s., both coasts present a comparatively unbroken line; and there is a remarkable correspondence between their projecting and retiring angles, the convex coast of Brazil lying opposite to the Gulf of Guinea, and the projection of Senegambia answering to the retirement of the American coast in the Caribbean Sea.

The whole of the new world, with the exception of the narrow strip lying w. of the Andes and Rocky Mountains, belongs to the *basin* of this ocean. It drains comparatively little of the old world, as may be seen by tracing the water-shed on a map. Owing to the numerous seas and inlets connected with it, the extent of its shores is immense, over 50,000 m., several thousands more than that of the shores of the Pacific and Indian Oceans. Except near the continents, the Atlantic has few islands compared with the Pacific. The chief islands in the open ocean are Iceland, Farøe, Bermudas, Azores, Ascension, St. Helena, the Falkland Islands, South Georgia, and Sandwich Land.

The chief A. currents are two. The *Equatorial Current*, which, starting from about the island of St. Thomas, in the Gulf of Guinea, with a rate of motion varying from 18 to 24 m. a day, proceeds w. on both sides of the equator till near Cape San Roque, where it divides, one branch running s. along the coast of Brazil, and the other along the coast of Guiana into the Caribbean Sea. The velocity of this current is 24 m. a day at the point where it curves s., whence it gradually diminishes in strength as it proceeds s. to little more than 6 m. a day. Within the south A. there is a complete circulation of the waters, induced by the prevailing winds, and maintained about 12 m. a day. Its force also varies with the months, being determined by the prevailing force of the wind of each month. Its breadth varies from 200 to 400 m.; and since it is fed by currents from n. and s. of it, its temperature is considerably lower in the e. than in the w. part of its course. The other great current is the *Gulf Stream*. This, originally part of the equatorial current, after flowing past the Guiana coast, and through the Caribbean Sea, issues from the Gulf of Mexico through the Strait of Florida,

ATLANTIC OCEAN.

and after following the direction of the American coast to about 40° , turns seaward, touches the great Newfoundland Bank, and gradually curving round is lost as a distinct current about the Azores. See GULF STREAM. The water of this stream is often upwards of 20° warmer than the surrounding ocean. The Gulf Stream has an immense influence on the Atlantic. Besides these great currents, the A. abounds in smaller ones, such as the northerly currents along the east Greenland and Labrador coasts (this Arctic current extending as far south as 36° n. lat., its rate being from 24 to 10 m. a day); the southerly current along the w. of Greenland; Rennel's current, w. of the Bay of Biscay; and the great current along the w. of Africa, from Morocco southward, till it is merged in the Guinea current. The whole of these currents follow in every case the prevailing winds of the regions where they flow.

Since over the whole of the e. half of the A., from abt. n. lat. 45° northward, the prevailing winds are s.w., there is over the same region a general flow of the water of the ocean towards the n.e., passing the British Isles, and thence along the coast of Norway, to some distance e. of the North Cape. It is to this flow that the mild temperatures of n.w. Europe must be referred. The amelioration of the winter climates from this cause is very great, amounting to about 30° in the Hebrides, and to fully 40° in the Lofoden Islands. This effect is directly due not to the winds alone, but to the winds and sea combined. The influence of currents on the temperature of the ocean is so great, that even in August, the isothermal of 50° touches the n. of Norway in lat. 72° n., whereas to s.e. of Newfoundland the same isothermal descends to about lat. 42° n. Again, on the meridian of 74° w., the change of temperature from lat. 40° to 35° n., or in 300 m., is $18^{\circ}0$; whereas on the meridian of 20° w. from lat. 40° to 10° , a distance of 1,800 m., the change of the temperature of the sea is only $15^{\circ}0$.

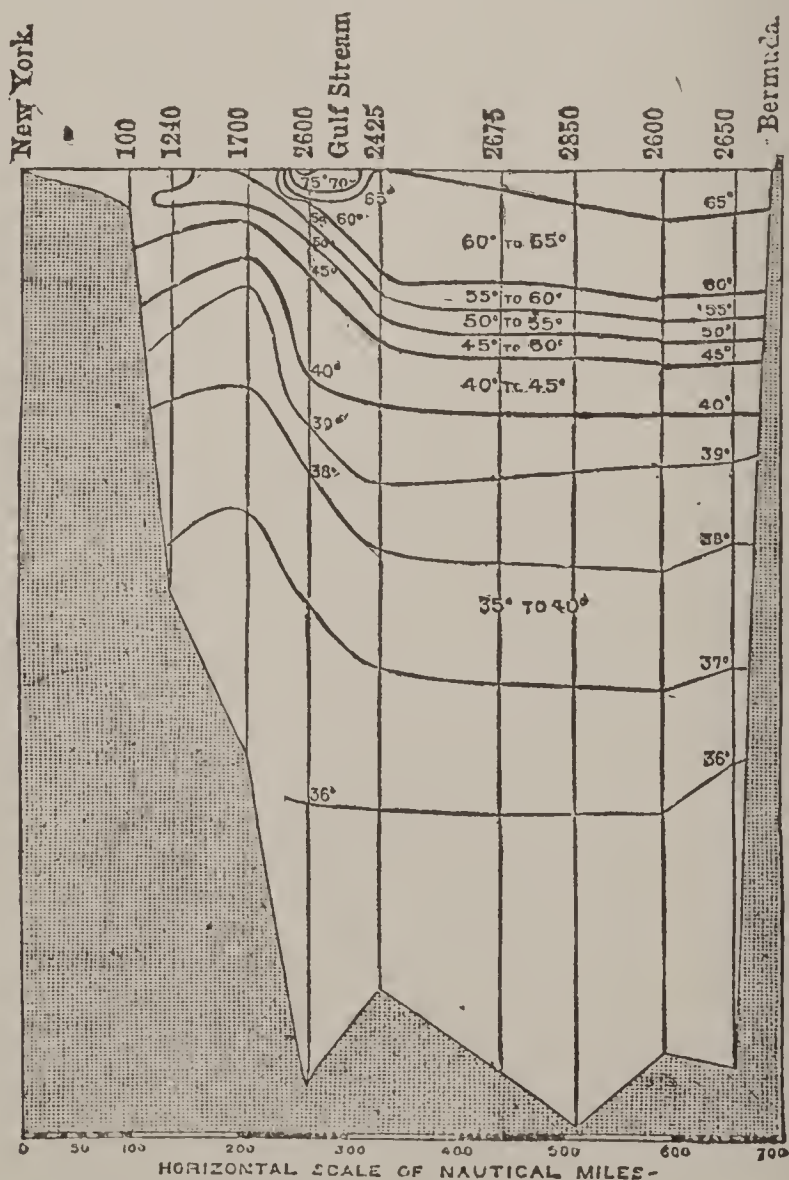
The temperature of the A. about the equator is, if we except the part between 20° and 35° w. long., above 80° : that of the Gulf of Guinea reaches the maximum of 85° in April; from Oct. to May it is above 80° ; in June and Sept. about 80° ; and in July and August it falls below 80° : that of the Caribbean Sea is above 80° from July to Oct., during the rest of the year below 80° , except in July. Between 10° and 30° lat. n., the temperature of the e. part of the A. is always from 3° to 7° colder than the w., and the maximum and minimum temperatures take place later in the year in the Caribbean Sea than off the African coast.

Much has been done recently, particularly by H.M.'s ships *Porcupine* and *Challenger*, in throwing light on the physical geography of the A. The most important of the observations are those of deep and bottom temperatures, from their connection with oceanic circulation, and the distribution of life in the depths of the sea, and the bearings of the questions thereby raised on geological speculation. See SEA. Animal life abounds at much greater depths than was formerly supposed; although beyond 6,000 ft. it gradually diminishes. A great part of the bottom of

ATLANTIC OCEAN.

the north Atlantic is covered with slimy 'ooze,' composed for the most part of the chalk-producing *globigerina*; in very deep parts this is replaced by a brown, clay-like mud, with few traces of animal forms.

Regarding the depth of the A., it is only recently that reliable data have been obtained; along certain tracts, especially those sounded by the *Challenger*, the profile of the bottom can now be laid down with considerable certainty. The deepest sounding made by the *Challenger* with its improved method of sounding (see SOUNDINGS), is 3,875 fathoms, or 23,250 ft., at a point about 90 m. off St. Thomas, West Indies. A remarkable ridge, about 400 m. wide, and 10,000 to 12,000 ft., or 2 to 2½ m. below the surface of the sea, extends along the bottom of the A. from Cape Clear in Ireland to Cape Race in Newfoundland, 1,640 m. Along this, known as the 'Telegraph Plateau,' the Atlantic cables are laid. The accompanying diagram exhibits the depths and temperatures in the track between New York and Bermuda.



Section of the North Atlantic Ocean between New York and Bermuda:

showing the Soundings (in fathoms) and Isothermal Lines obtained in H.M.S. *Challenger*, Captain G. S. Nares, 1873.

ATLANTIC TELEGRAPH.

ATLANTIC TELEGRAPH: for submarine communication of messages between America and Europe. In 1842, Prof. Morse of New York, having stretched a submarine cable between Castle Garden and Governor's Island, New York, and succeeded in transmitting an electric current from one end to the other, expressed his opinion that it would be possible to effect an electrical communication through the sea. After further investigations, he announced to the sec. of the treasury of the United States, 'that a telegraphic communication on his plan might with certainty be established across the Atlantic.' Three years earlier, Sir William O'Shaughnessy, at Calcutta, gave practical proof that electrical messages could be conveyed through water, for short distances, by transmitting signals through a cable which he had laid across the Hoogly river; but it was not until 1854 that Mr. Cyrus W. Field of New York proposed that the project should be undertaken, and, with others, began to discuss means for its practical realization. Lieut. Maury, U.S.N., discovered that the bed of the Atlantic, between Ireland and Newfoundland, forms a kind of plateau, covered with soft ooze, favorably situated as a resting-place for a cable. See ATLANTIC OCEAN. In 1855, negotiations were carried on, partly in America, but chiefly in England, to establish a company and raise capital; which objects were attained in 1856. The 'New York and Newfoundland Telegraph Company' connected Newfoundland with the mainland of America by cables and land-wires; but 'the Electric Telegraph Company,'—all whose privileges under liberal grants and guarantees from the British and U. S. govts. passed, 1856, to a new organization, the 'A. T. Company'—undertook the laying of a cable from Newfoundland to Ireland, with a capital of \$1,750,000, in shares of \$5,000 each. After experiments, numbering about 2,000, with 62 different kinds of cable, to determine the one best fitted to convey electricity through such a length, and at such a depth beneath the sea, a length of 2,500 English m. of cable was ordered, and completed in the summer of 1857. The conductor consisted of 7 fine copper wires, No. 22 gauge, twisted tightly together, forming a cord $\frac{1}{12}$ inch thick, and weighing 107 lbs. per mile. This thickness was increased to $\frac{3}{8}$ inch by a core of three layers of gutta-percha. Outside the core was a jacket of hempen yarn, saturated with pitch, tar, beeswax, and boiled linseed oil. The outer sheath consisted of 18 strands, each formed of seven No. 22 iron wires. The whole diameter was about $\frac{6}{10}$ inch, and the weight one ton per mile, equal, when submerged, to abt. 14 cwt.: 332,500 m. of iron and copper wire were used in its construction. In the manufacturing processes, the wires and yarns were twisted round each other by revolving drums and circular tables worked by steam-power; while the coatings of gutta-percha were applied by forcing the substance through dies which had the copper conductor passing through their centre. The frigate *Niagara* and the line-of-battle ship *Agamemnon*, the first lent by the U. S. government and the last by the English, took 1.250 m. of the cable each, and

ATLANTIC TELEGRAPH.

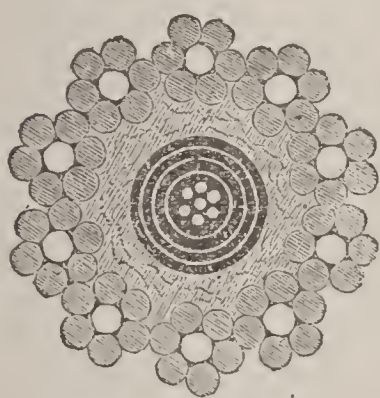
steamed forth from Valentia (w. coast of Ireland), 1857, Aug. 7, the *Niagara* paying out her portion of cable as she went. On the 11th, in an attempt to slacken the the rate of paying out, the cable snapped, and the end sank in 2,000 fathoms water, at 280 m. from Ireland. The appliances on board were not sufficient to remedy the disaster, and the two ships returned to Plymouth, where the two portions of cable were placed in tanks until the next following year.

The A. T. Company raised more capital, made 900 m. additional cable, and prepared for a new attempt in 1858. The *Niagara* and *Agamemnon* were again employed; but the submersion was to begin in mid-ocean, one ship proceeding e., and the other w., after splicing the two halves of the cable. They left Valentia, June 10; but it was not till the 26th that they could finish the splice and commence the submersion. On the 29th, a double breakage took place, and 144 m. of cable went to the bottom wholly severed from the rest. The *Agamemnon* returned to England for improved appliances and further instructions; and a month was thus lost. On July 29, the two ships again spliced their two halves of cable in mid-ocean, and proceeded with their work till, Aug. 6, the *Agamemnon* reached Valentia, and the *Niagara* Newfoundland, and exchanged congratulatory messages through the whole length of cable. Soon afterwards, the extremities of the cable having been put into connection with the recording instruments, the following message was flashed under the ocean in 35 minutes: 'Europe and America are united by telegraph; glory to God in the highest; on earth, peace and good will toward men.' Also greetings were exchanged between the queen and the president, and between many public bodies and official persons. The station at Newfoundland was connected by wires and cables with the general telegraphic system of America, and that at Valentia with the general system of Europe. The cable continued working until Sept. 1, sending 129 messages (averaging 11 words each) from England to America, and 271 from America to England. The signals then ceased, and the cable became useless: it had been injured by the winter's sojourn at Plymouth. Then came a great revulsion in public feeling; ineredulity and ridicule took the place of enthusiasm; although a single message of the number sent was known to have saved the commercial world abt. \$300,000 in insurance of vessels. Still Mr. Field did not lose his courage; indeed his efforts were redoubled on both sides of the ocean. For six years, 1858-64, the company was engaged in endeavoring to raise new capital, and to obtain increased subsidies from the English and American governments; while scientific men were making improvements in the form of cable, and in the apparatus for submerging it. At length the Telegraph Construction and Maintenance Company (formed by an amalgamation of the Gutta-percha Company with the wire-cable-making firm of Glass & Elliott) made an entirely new cable, much thicker and more costly than the former one. The conductor, 300 lbs. per mile, and $\frac{1}{4}$ inch thick,

ATLANTIC TELEGRAPH.

consisted of seven No. 18 copper wires, each $\frac{1}{20}$ inch thick. The core was formed of four layers of gutta-percha alternating with four of Chatterton's Compound (a solution of gutta-percha in Stockholm tar); the core and conductor together were 700 lbs. per mile, and $\frac{3}{16}$ inch thick. Outside this was a jacket of hemp or jute yarn, saturated with preservative composition. The sheath consisted of 10 iron wires, No. 13 gauge, each previously covered with five tarred Manilla yarns. The whole cable was $1\frac{1}{8}$ inch thick, and weighed $35\frac{3}{4}$ cwt. per mile, with a breaking strain of $7\frac{3}{4}$ tons.

As the cable (2,300 m.) weighed more than 4,000 tons, it was resolved to employ the *Great Eastern* steamship to carry it out and lay it. Three enormous iron tanks were built in the fore, middle, and aft holds, from 50 to 60 ft. diameter each, by $20\frac{1}{2}$ ft. deep; and in these the cable was deposited, in three vast coils. The *Great Eastern* started from Valentia, 1865, July 23, with her burden, the main cable being joined end to end to a more massive shore cable, which was drawn up the cliff at Foilhammerum Bay, to a telegraph house at the top. The electric condition of the cable was kept constantly under test during the progress of the ship; and more than once the efficiency was disturbed by fragments of wire piercing the gutta-percha, and destroying the insulation. On Aug. 2,



Section and External Appearance of Atlantic Cable of 1866.

the cable snapped by over-straining, and the end sank to the bottom in 2,000 fathoms of water, at a distance of 1,064 m. from Ireland. Then commenced the remarkable process of dredging for the cable. A five-armed grapnel, suspended from the end of a strong iron-wire rope, five m. long, was thrown overboard; and when it reached the bottom, it was dragged to and fro across the line of cable by slow steaming of the *Great Eastern*; the hope being that one or other of the prongs would catch hold of the cable. A series of disasters followed by the breaking of swivels, and the loss of grapnels and ropes; until at length, Aug. 11, it was found that there were no more materials on board to renew the grappling. The *Great Eastern* returned to England, leaving (including the operations of 1857-8) nearly 4,000 tons of electric cable useless at the bottom of the Atlantic.

ATLANTIC TELEGRAPH.

A new capital, and new commercial arrangements altogether, were needful for a renewal of the attempt. Another cable was made, slightly differing from the former. The jacket outside the core was made of hemp instead of jute; the iron wires of the sheath were galvanized, instead of being left in their natural state; and the manilla hemp which covered them was left white instead of being tarred. These few changes made it weigh nearly 500 lbs. per mile less, mainly through the absence of tar; while its strength or breaking strain was increased. Enough of this cable was made to span the Atlantic, with allowance for slack; while a sufficient addition of the 1865 cable was provided to remedy the disaster of that year.

The Atlantic telegraph operations in 1866 were remarkable and interesting. On July 13, the *Great Eastern* set forth from Valentia, with the assistant steamers *Terrible*, *Medway*, and *Albany*. The route was chosen midway between those of the 1858 and 1865 cables, for the most part a few miles from each. The *Great Eastern* exchanged telegrams almost continuously with Valentia during her progress. The mishaps were few in number, and easily remedied; and the *Great Eastern* safely entered the harbor of Heart's Content, Newfoundland, on the 27th. After this, operations commenced for recovering the end of the 1865 cable, and completing the submersion. The *Albany*, *Medway*, and *Terrible* set off, Aug. 1, to the spot on the ocean beneath which the end of the cable was lying, or as near to it as calculations could establish. Certain buoys, left anchored there twelve months previously, had been carried away by the storms of the preceding winter; but the latitude and longitude had been very carefully registered. The *Great Eastern* started from Heart's Content on the 9th, and then commenced a series of grappling operations, which continued the rest of the month. The cable was repeatedly caught, and raised to a greater or less height from the ocean-bed; but something or other snapped or slipped every time. After much trial of patience, the end of the cable was safely fished up Sept. 1; and electric messages were at once sent through to Valentia, as well as if the cable had not had twelve months' soaking in the Atlantic. An additional length having been spliced to it, the laying recommenced; and on the 8th the squadron entered Heart's Content; having thus succeeded in laying a second line of cable from Ireland to America.

With improved cables and machinery, the work has been so greatly expedited that, 1894, July 2, the *Fara-day* completed the laying of a cable between Waterville, Ireland, and Canso, Nova Scotia, having laid the deep-sea portion (about 1,600 nautical m.) in 12 days. On the 27th of the same month, the *Scotia* completed the laying of the cable between Valentia, Ireland, and Heart's Content, Newfoundland, in somewhat less than 12 days.

The following lines of telegraph cables have now (1897) been laid beneath the Atlantic or some portion of it:

Anglo-American Telegraph Co.: from Valentia, Ireland, to Heart's Content, Newfoundland, 4 cables, 7,505 m.; from

ATLANTIDÆ.

Minon near Brest, France, to St. Pierre, Miquelon (off the s. coast of Newfoundland), 1 cable, 2,718 m.

Commercial Cable Co.: Waterville, Ireland, to Canso, Nova Scotia, 3 cables, 6,888 m.; Canso, Nova Scotia, to New York, 1 cable, 828 m.; Canso, Nova Scotia, to Rockport, Mass., 1 cable, 519 m.

Direct United States Cable Co.: from Ballinskellig's Bay, Ireland, to Halifax, Nova Scotia, 1 cable, 2,564 m.; from Halifax, Nova Scotia, to Rye Beach, N. H., 1 cable, 535 m.

Western Union Telegraph Co.: Sennen Cove, near Penzance, England, to Dover Bay, near Canso, Nova Scotia, 2 cables, 5,107 m.; Dover Bay, Nova Scotia, to New York, 2 cables, 1,776 m.

Compagnie Française du Télégraphe de Paris à New York: from Brest, France, to St. Pierre, Miquelon, 1 cable, 2,282 m.; from St. Pierre to Cape Cod, Mass., 1 cable, 828 m.

Brazilian Submarine Telegraph Co.: from Carcavellos, near Lisbon, Portugal, to Madeira, Cape de Verde Island, and Pernambuco, Brazil, 6 cables, 7,369 m.

Central and South American Telegraph Co.: 15 cables, 7,496 m.

Cuba Submarine Telegraph Co.: 4 cables, 1,048 m.

Anglo-Spanish-Portuguese System: 11 cables, 3,566 m.

Direct Spanish Telegraph Co.: from Lizard Point, England, to Bilbao, Spain, 4 cables, 708 m.

Europe and Azores Telegraph Co.: 2 cables, 1,052 m.

Halifax and Bermuda Cable Co.: 1 cable, 850 m.

Western and Brazilian Telegraph Co.: 16 cables, 6,147 m.

West India and Panama Telegraph Co.: 22 cables, 4,554 m.

West Coast of America Telegraph Co.: 8 cables, 1,964 m.

West African Telegraph Co.: 12 cables, 3,055 m.

African Direct Telegraph Co.: 8 cables, 2,749 m.

There are, besides the lines above specified, numerous cables along the various coasts, the lines along the American coasts aggregating more than 2,000 m.

The means of grappling and raising cables in mid-ocean, as well as of ascertaining the exact location of any break, have been carried to such perfection that any needed repairs are readily made. See TELEGRAPH.

ATLANTIDÆ, n. pl. *ăt-lăn'tî-dē*: in *ethn.*, according to Latham, one of the primary varieties of the human species. The maxillary profile is projecting; the nasal one generally flat; the frontal one retiring; the cranium dolichocephalic, the parietal diameter being generally narrow; eyes rarely oblique; skin often jet black, very rarely approaching a pure white; hair crisp, woolly, rarely straight, still more rarely light-colored. Languages with an agglutinate, rarely an amalgamate inflection. Distribution, Africa. Influence on history of the world, inconsiderable.—In *zool.*, family of molluscs belonging to class *Gasteropoda*, order *Nucleobranchiata*. There is a symmetrical discoidal shell, sometimes closed by an operculum. The gills are contained in a dorsal mantle cavity.

ATLANTIS—ATLAS.

ATLAN'TIS. according to ancient tradition, a vast isl. and in the Atlantic Ocean. It is first mentioned by Plato, who represents an Egyptian priest as describing it to Solon, but, of course, according to Plato's view of the matter. In this description, A. appeared as an island larger than Libya and Asia Minor taken together, and lying off the Pillars of Hercules in the Atlantic Ocean. Plato gives a beautiful picture of the interior of this imaginary land, and enriches it with a fabulous history. Some early writers supposed that the Canary Islands were the remains of the old A.; for Plato had stated that at the close of the long contest which its inhabitants maintained against the Athenians, nine thousand years before his time, the sea suddenly engulfed the island, and had ever since been unnavigable, by reason of the shoals of mud created by the sunken island. Some found it in the Scandinavian peninsula; others (first Bircherod, 1685) have supposed the vast island of A. mentioned by Plato, as well as the great unnamed island spoken of by Pliny, Diodorus, and Arnobius, may have been the new world. For curious array of evidence that A. was the scene of the first civilization and the deluge, see *Atlantis*, by Ignatius Donnelly.

ATLAS, n. *ăt'lās*, ATLASES, n. plu. *ăt'lās-ēz* [Gr. *Atlas*, name of a giant who, the ancient Greeks pretended, bore up the earth upon his shoulders]: a collection of maps bound together; the first vertebra or top joint of the neck, or that which supports the head. ATLANTES, n. plu. *ăt-lăn'tēz*, in *arch.*, the whole or half figures of men employed instead of columns or pillars. ATLANTIAN, a. *ăt-lăn-tē'ăn*, or ATLANTIAN, a. *ăt-lăn'shī-ăn*, pertaining to Atlas, or to the isle of Atlantis; strong; gigantic. ATLANTIDES, n. pl. *ăt-lăn'tī-dēz* [L. *Atlantides*, *Atlantiades*]: in *class. myth.*, the daughters of Atlas, seven of whom were called also Pleiades, after their mother Pleione. After their death they were supposed to have been transformed into the constellation Pleiades; in *astron.*, a designation sometimes given to the stars constituting the Pleiades.

ATLAS: that piece of the human vertebral column which is nearest to the skull; in other words, it is the first cervical vertebra. It may be known from the other six by its being without a body or spinous process, by its being a mere irregular bony ring, partly divided into two unequal parts by a constriction; this division in the recent subject is completed by a ligament, the part in front being occupied by the tooth-like process of the second cervical vertebra, and that behind, by the spinal-marrow. On each side, the ring is very thick; it is smooth and cupped above to receive the condyles of the occipital bone. The corresponding parts below are flat, and rest on the second cervical vertebra.

The A., with the occipital bone, forms the joint on which the head moves in bowing; and turns on the pivot of the second cervical vertebra, when the head is moved from side to side.

ATLAS, in Ancient Myth.: according to Hesiod's *Theog-*

ATLAS.

ony, one of the Titans, son of Iapetus and Clymene, bro. of Menœtius, Prometheus, and Epimetheus. Apollo-dorus, however, states him to have been a son of Asia, and Hyginus, a son of Æther and Gaea. He married Pleone, daughter of Oceanus (or Hesperis, his own niece), and became the father of the Pleiades. As leader of the Titans, he attempted to storm the heavens, and for this supreme treason was condemned by Zeus to bear the vault of heaven on his head and hands—the sting of this mythological punishment obviously being, that A. was compelled to support what he thirsted to destroy. The later writers, however, rationalize the myth, and state that A. was a mighty king who had great skill in astronomy, and only tried to storm heaven intellectually.—In consequence of the ancient views which made the vault of heaven rest on solid pillars or other supports, the name A., originally mythological and cosmogonic, was introduced into geography. Mercator, in the 16th c., gave the name A. to a collection of maps; probably because the figure of A. supporting the heavens had been given on the title-pages of such works.

ATLAS: a mass of mountain-land in the w. part of n. Africa. Herodotus mentions a smoking mountain of this name situated on the s.w. of the Little Syrtis, twenty days' journey w. from the Garamantes, styled by the natives the 'pillars of heaven.' By later writers, after the time of Polybius, the name A. was always given to the chain of mountains in n.w. Africa extending from the island of Cerne (now Cape de Ger) n.w. through Mauritania, and Tingitana (now Fez and Morocco), and including also the heights dispersed through the region of Sahara. It is divided into the Little Atlas and the Great Atlas; the former denominating a secondary range in the country of Sous, and the other the loftier mountains of Morocco. The A. is not properly a mountain-chain, but rather a very irregular mountainous mass of land formed of many chains running in various directions, meeting in mountain-knots, or connected by yokes, or short chains of inferior height, and diversified still further by several solitary mountains and groups of mountains. The A. attains its greatest height (13,000 ft.) in Morocco, the only part where it rises above the snow-line, and obtains the name of *Jebel-el-Thelj*, or Snowy Mountains. Its highest peaks are *Miltsin*—27 m. s.e. of the city of Morocco—*Bibawan*, and *Tagherain*. The most southern chain diverging here from the central mass bears the name *Jebel-Hadnar*. The heights approach the sea, and form the promontories jutting out into the Atlantic. From Morocco, the A. gradually decreases in height towards the e. In Algeria, the elevation is only 7,673 ft.; in Tunis, 4,476 ft.; and in Tripoli, 3,200 ft. The whole mountain-system is intersected by the valley of the *Muluia* river, which flows through the n.e. part of Morocco, and falls into the Mediterranean. The slopes on the n., w., and s. are covered with vast forests of pine, oak, cork, white poplar, wild olive, etc. The valleys are well watered and capable of cultivation with great profit. The A. seems to be chiefly calcareous in its composition.

ATLASITE—ATMOMETER.

The mineral wealth remains almost wholly unexplored, though copper, iron, lead, antimony, etc., are reported to exist in abundance.

ATLASITE, n. *ăt'lăs-īt* [apparently from Ger. *atlas*, satin, named from the satiny or silky character of the mineral. The term corresponds to Ger. *atlaserz*, fibrous malachite]: a mineral believed by Dana to be a possible mixture of azurite and atacamite. It is a copper carbonate that contains chlorine.

ATMIDOMETER, n. *ăt-mĩ-dǝm'ět-ēr* [Gr. *atmidos*, genit. of *atmis*, the steam of a fomentation. Cognate with *atmis*]: an instrument still in use, invented by Babington, for measuring the evaporation from water, ice, snow, etc. It consists of two glass or metal bulbs, one of them placed above the other, with which it communicates by a narrow neck. The lower one is weighted with shot or mercury, and the upper has on it a small glass or metal stem, with a scale graduated in grains and half-grains. On the top of all there is a shallow pan. The instrument being immersed in a vessel of water through a circular hole in which the stem rises, distilled water is gradually poured into the pan above, causing it to sink to the point at which the zero of the stem is on a level with the cover of the vessel. As then the water in the pan gradually evaporates, the stem slowly ascends, the amount of evaporation being indicated in grains on the graduated scale.

ATMOLOGY, n. *ăt-mǝl'ǝ-jĩ* [Gr. *atmos*, vapor; *logos*, discourse]: the science of vapor. AT'MOLOG'ICAL, a. *-lǝj'ĩ-kāl*, pertaining to the science of vapor. ATMOL'OGIST, n. *-ǝ-jĩst*, one who.

ATMOLYZE, v. *ăt-mǝ-lĩz'* [Gr. *atmos*, smoke or steam; *lusis*, a loosing or setting free—from *luō*, to loose]: to separate, at least partially, two gases or vapors of unequal diffusibility, which are combined with each other. ATMOLYSIS, n. *ăt-mǝl'ĩ-sĩs*, the act or operation of separating two gases in combination, from each other.

ATMOMETER, n. *ăt-mǝm'ě-tēr* [Gr. *atmos*, vapor; *metron*, a measure]: an instrument for measuring the amount of evaporation from any moist surface in a given time: sometimes termed ATMIDOMETER. It was invented by Sir John Leslie, and consists of a very thin ball of porous earthenware, from one to three inches in diameter, having a small neck firmly cemented to a long and rather wide tube of glass, to which is adapted a brass cap with a narrow collar of leather to fit closely. It is filled with distilled or pure water, and its cap screwed tightly. It is then suspended out of doors in a situation where it is exposed freely to the action of the wind, but it is sheltered from rain. As the water evaporates from the external surface of the ball, it transudes through its porous substance, and the waste is measured by the corresponding descent of the liquid in the stem. To test the amount of this descent, there is a finely-graduated scale. When the water has sunk to the bottom of the stem, the latter requires to be filled again. The accuracy of the A. is only approximate.

ATMOSPHERE.

ATMOSPHERE, n. *ăt' mōs-fēr* [Gr. *atmos*, vapor; *sphaira*, a sphere]: the whole mass of air, clouds, and vapor surrounding the earth. **ATMOSPHERIC**, a. *ăt' mōs-fēr'ik*, or **AT'MOSPHER'ICAL**, a. *-ī-kāl*, pertaining to the air; produced or operated on by the atmosphere. **AT'MOSPHER'ICALLY**, ad. *-lī*. **AT'MOSPHER'IC PRESSURE**, the weight of the atmosphere on a surface, being about 15 lb. to the square inch at the level of the sea. **ATMOSPHER'IC TIDES**, tides which must exist in the atmosphere as they do in the ocean, from the attractions of the moon and sun.

AT'MOSPHERE: the gaseous envelope which surrounds the earth. The A. is indispensable to animal and vegetable life, the modifying and retaining of solar heat, the transmission of sound, the gradual shading of day into night, the disintegration of rocks, and the occurrence of weather phenomena. In consequence of the action of gravity, the A. assumes the form of a spheroidal stratum concentric with the earth and presses heavily on its surface. It exhibits, in common with all fluid bodies, the usual characteristics of hydrostatic pressure, but its internal condition differs from that of a liquid inasmuch as its particles repel each other, and can only be held in proximity by external force. From this, it follows that the volume of any portion of air varies much more under the influence of external pressure than that of an equal volume of water; hence, the stratum of air nearest the earth is denser than strata in the upper regions, where, from their being subjected to the weight of a smaller mass of superincumbent air, the repulsive force of the particles has freer play.

That air has *weight*, is illustrated by the following simple experiment. If a hollow glass globe of five or six inches in diameter be weighed, first when filled with air, then after the air has been extracted from it by means of the air-pump, it will, when thus exhausted, weigh sensibly less than it did before, and the difference of the two results will represent the weight of the quantity of air withdrawn. It has been determined by Biot and Arago that 100 cubic inches of dry air, when the barometer is at 30 inches, and the thermometer at 60° Fahrenheit, weigh 31.074 grains. The law of Archimedes (see **ARCHIMEDES**, **PRINCIPLE OF**), that a body immersed in a fluid loses a part of its weight equal to the weight of the volume of fluid displaced by it, finds its application in the A. as well as in water. If a glass globe filled with air and closed be suspended at the extremity of the beam of a delicate balance, and be kept in equilibrium by a brass weight at the other extremity, and if the whole be then placed under the receiver of an air-pump, and the air extracted, the equilibrium previously existing in air will be disturbed, and the larger body will become the heavier. The reason of this is, that when first weighed, they each lose as much of their own weight as that of the respective volumes of air displaced by them, and are therefore made buoyant, though in different degrees, the ball with the larger volume having the greater buoyancy. In a vacuum, they are deprived of this buoyancy, and the larger body, suffering the greater loss, becomes

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sensibly heavier than the other. In like manner, a balloon filled with heated air or hydrogen gas is lighter than the volume of air displaced by it. It is therefore forced upward until it reaches a stratum of such density that the weight of the volume of air there displaced by it equals the weight of the balloon itself. In this stratum it will remain poised, or move horizontally with the currents to which it may be exposed.

In endeavoring to determine the *form* of the atmospheric envelope, it is necessary to bear in mind that, according to the law of fluid-pressure, in order to produce a state of equilibrium at the level of the sea, the pressure of the A. must be equal at that level over the whole of the earth's surface. Gravity acts with less force on the air at the equator than on that at the poles, in consequence of the spheroidal form of the earth. It has therefore, in addition, to contend with the centrifugal force, which entirely fails at the poles, and which has a tendency to lighten the air by acting contrary to gravity. Hence we infer, that, in order to produce the same pressure at the level of the sea, the atmospheric height at the equator must be greater than that at the poles, and that the A. must therefore possess the form of an oblate spheroid, whose oblateness is considerably greater than that of the earth itself. The greater heat at the tropical regions must also have the effect of increasing the oblateness.

The *height* of the A. has not yet been determined. That it must have a certain limit, is evident from the consideration that there must be a point at which gravity on the one hand, and centrifugal force and the repulsive action of the particles on the other, are poised, and beyond which—the latter forces overbalancing the former force—the aerial particles would be borne away from the earth. As, however, the law of the diminution of temperature, which materially affects the repulsive action, is unknown for the upper regions of the air, it is impossible to calculate the height of the atmosphere from the relations of these forces. From the observation of luminous meteors, it is inferred that it is at least 100 m. high, and that, in an extremely attenuated form, it may reach 200 m.

The *pressure* of the A. is one of its most important properties. Its effect is exhibited in the action of the ordinary water-pump. The piston is fitted air-tight in its cylinder, and on being drawn up creates a vacuum. The water within the pump, being thus freed from pressure, while that outside of it is exposed to the pressure of a column of air reaching to the surface of the A., is at once forced up by reason of the weight of air which it must rise to balance. The ascent of the water takes place until the piston has reached the height of nearly 34 ft., from which we conclude that a column of air is equal in weight to a column of water of the same horizontal section, and of the height of nearly 34 ft. As mercury is 13·6 times heavier than water, a mercurial column freed from atmospheric pressure at the one extremity, and subjected to it at the other, is 13·6 times less in height than the column of water, or

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about 30 inches. From the more convenient size of this column, mercury has been adopted as the standard for atmospheric pressure, and is employed in ordinary barometers (q.v.). A mercurial column 30 inches in height and 1 square inch in section weighs 15 lbs. (more accurately 14.73), which gives the equivalent weight of a column of atmospheric air of the same section.

The word A. is often employed to express this weight or pressure on a sq. inch of surface, so that when we speak, in Mechanics, of the pressure of steam on a boiler as amounting to three atmospheres, we mean a pressure of 45 lbs. on the sq. inch. The pressure of the A. on a sq. inch being thus ascertained, we have merely to multiply it by the number of sq. inches on the earth's surface to obtain the total weight of the A. It amounts to 11.67085 trillions of lbs. or about $\frac{1}{1880000000}$ of the earth's mass. It must be observed that the height of the barometric column is not a constant quantity, as it varies with the latitude, the season of the year, and the hour of the day. At London its mean height is 29.88 inches; at Paris, 29.92 inches. The pressure of the A. in the northern hemisphere increases as we recede from the equator, reaching a maximum at 30° n. lat., and decreasing from 30° to 65°, where it again begins to rise. The greater height at 30° is said to be due to the accumulation of air at that latitude by the action of the trade-winds. As the heat of the earth's surface increases the rarity of the air above it, and causes the air at the top of the heated column to overflow, it would be expected that, during the year, the barometer would stand at a minimum in summer, and a maximum in winter. In reality, however, though the barometer is highest in mid-winter, there is another maximum in mid-summer, making thus two minima—one in spring, the other in autumn. This arises from the part borne by watery vapors in the pressure of the atmosphere. The heat of mid-summer introduces into the air a large quantity of moisture, in the form of elastic vapor, which, adding its pressure to that of the dry air, raises what would otherwise be the minimum barometric column to a higher point than that at which it stands in spring and autumn. Similar causes affect the pressure of the A. during the 24 hours of the day. There are two maxima—one at 10 A.M., the other between 10 and 11 P.M.; and two minima—at 4 A.M. and 4 P.M. Very slight variations indicate the existence of atmospheric tidal waves; but this subject is still obscure. The pressure of the A. exercises a most important influence on the organism of the human frame. A man of ordinary stature is exposed to a pressure of about 14 tons; but as the air permeates the whole body, and presses equally in all directions, no inconvenience is found to result from it. From experiments instituted by the brothers Weber in Germany, it has been ascertained that the heads of the thigh and arm bones are kept in their sockets by the pressure of the A.; and in balloon ascents the aeronaut often suffers from bleeding at the nose, lips, and even eyes—a fact that would seem to

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indicate that the strength of the blood-vessels has been adjusted with reference to atmospheric pressure.

Chemical Composition of the A.—Recent chemical researches give the following as the mean composition of 100 volumes and of 100 grains of dry air:

	Volumes.	Grains.
Nitrogen, ...	79·02	76·84
Oxygen, ...	20·94	23·10
Carbonic acid, ...	0·04	0·06
	100·00	100·00

Besides the substances just named, other gaseous matters occur (see ARGON) in quantities too small sensibly to increase the bulk of the A.; such as ammonia and ammoniacal salts, carburetted and sulphuretted hydrogen, carbonic oxide, sulphurous and sulphuric acid, nitric acid, and perhaps iodine, the quantity and even the presence of which are affected by local and meteorological causes. Roughly speaking, then, dry air may be said to consist of 4 volumes of nitrogen and 1 of oxygen, with a slight admixture of carbonic acid, and a mere trace of several other substances. As, however, the air of the A. is never found dry, we must add to the constituents already named watery vapor, the amount of which is constantly changing, according to locality, weather, wind, and temperature. It is stated that of 1,000 grains of atmospheric air, the proportion due to aqueous vapor varies from a minimum of 4 to a maximum of 16 grains. By far the most active chemical constituent of the A. is oxygen, essential to the existence of animal life, the maintenance of combustion, the rusting of metals, and the occurrence of many other chemical phenomena. A small portion of this oxygen occurs in the form of ozone (q.v.), a modification which, according to recent chemical discoveries, is important in the chemistry of the A. The nitrogen which forms the bulk of the A. has few chemical properties of importance, but performs the important part of diluting the oxygen, which, if it occurred alone, would act with too great intensity. The presence of carbonic acid in the air is shown by the production of the white carbonate of lime in lime-water freely exposed to its influence. Carbonic acid is produced in all processes where carbonaceous matter unites itself with the oxygen of the air, such as in animal respiration, in combustion, in fermentation, in putrefaction, and similar processes. The green leaves of plants, on the other hand, possess, in presence of sunshine, the power of decomposing carbonic acid into its elements, absorbing the carbon for their own tissues, and restoring the oxygen to the A. in its original purity. Between the processes above mentioned, on the one hand, and the action of plants on the other, the quantity of carbonic acid in the air is kept nearly constant. From the table it will be seen that 10,000 volumes of atmospheric air contain four volumes of carbonic acid. If it occurred in a much larger proportion, being poisonous, it would become dangerous to animal life; and if it occurred in a much less proportion, the vegetable world would lack

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its requisite nourishment. The other substances, of which traces are always or only sometimes found in atmospheric air, are difficult to detect in the air itself, but are generally found dissolved in rain-water, more especially in that which has fallen immediately after a long drought. Of these, by far the most important and widely diffused are ammonia and ammoniacal salts, which are of essential importance to the vegetable economy, because, dissolved in the rain, they furnish plants with the nitrogen required by them for the production of their flowers and fruit. Nitric acid is detected in the air after thunder-storms, sulphuretted hydrogen in the tainted air of sewers and such like places, and sulphurous and sulphuric acid only in the neighborhood of chemical or smelting works. A considerable quantity of carbonic oxide and carburetted hydrogen escapes unconsumed from our furnaces; and although the latter gas is in addition given off to the air in marshy and bituminous districts, the two occur in almost inappreciable quantity in the atmosphere.

In addition to its gaseous constituents, the A. contains solid substances in a state of exceedingly fine division, the presence of which is revealed in the sunbeam. Many of these minute particles, being the seeds or germs of plants and animals, must exert an important influence on the organic substances on which they may finally settle, inducing in many of them the conditions of disease or putrefaction.

When the composite nature of the A. was first discovered, it was supposed to be a chemical combination of nitrogen and oxygen, but further inquiries have rendered this opinion highly improbable. When any two bodies unite with each other chemically, the substance which results from their combination invariably possesses properties which the original constituents did not possess. Now the atmospheric union of oxygen and nitrogen is distinguished by no properties which may not be attributed individually to these gases. We have, then, in this respect, no indication that the atmospheric combination of oxygen and nitrogen is a chemical one. Again, when any composite gas is dissolved in water, the proportion of the ingredients dissolved in it is exactly the same as that in which they occur in the compound itself; but this is not the case with air dissolved in water, which is found to be richer in oxygen than atmospheric air. Now, as oxygen dissolves more readily in water than nitrogen, it is manifest that this larger proportion of oxygen arises from both gases acting independently of each other in respect to the water, a condition that would be impossible if they were in chemical union. From these and other corroborative facts, the A. is considered to be simply a mechanical combination of the gases contained in it. This, however, does not prevent the A. from having a uniform composition, as might at first sight be supposed; for when gases are mixed with each other, they interming thoroughly throughout the whole space occupied by them. Local causes may temporarily affect the relative proportion of the atmospheric ingredients, but the changes are so minute as to be detected by only the most delicate analysis.

ATMOSPHERIC ELECTRICITY.

ATMOSPHERIC ELECTRICITY: opened to scientific investigation first by Benjamin Franklin. He demonstrated the identity of the lightning of the heavens with the electric spark. By his famous kite-experiment, he ascertained that the thunder cloud assumes an electrical condition precisely similar to that of the conductor of an electrical machine, and that the same mechanical and luminous effects are common, though in different degree, to both. The attention directed first by this discovery to the A. E., as displayed in the thunder-cloud, has since been extended to the electrical condition of the air in all the different states of the weather. It is now found that the air is sensibly electrical not only when the sky is overcast with thunder-clouds, but when the weather is clear, or when no thunder-clouds are present. Observations on A. E. are made by delicate electrometers connected with insulated rods at the top of the building, or other collecting apparatus. The following are some of the results got by continental observers: When the sky is clear and free from clouds, the A. E. is always positive, and an electroscope exposed to the action of the air is charged with positive electricity. On the other hand, the electricity of the ground is found to be negative. This was shown in a very ingenious way by Volta, who, by catching the fine spray of a fountain on the plate of a straw electroscope, found the straws to diverge with the negative electricity communicated to them by the water, which was necessarily of the same character as that of the ground. Because of this fact electroscopes, or the collecting apparatus connected with them, must not be overtopped by the neighboring trees or buildings, the negative electricity of which materially affects the indications given; and it is due to the same fact that no A. E. is discovered in the middle of a wood, or in a room, however high the ceiling. Under a clear sky, the potential of the A. E. is found to increase as we ascend, the lower aerial strata being less electrical than the higher. Becquerel proved this by a simple experiment on the plateau of Mount St. Bernard. On a piece of oiled silk he placed a silk thread, covered with tinsel, one end of which, terminated by a ring, was connected with the rod of a straw electroscope, and the other end was tied to an arrow armed with a metal point. When the arrow was shot horizontally, the straws showed no divergence; but when the arrow was shot upwards, they opened as it ascended, and diverged most when the arrow, in ascending, disengaged the ring from the rod of the electroscope. The same fact is shown in the following way: When a very delicate electroscope is adjusted for any particular position, it will, when elevated a few feet above that position, give indication of positive electricity, and when placed a few feet below, it will be charged negatively. In clear weather, likewise, the A. E. is found to be subject to certain daily periodical variations, and appears to have two maxima and two minima in the course of twenty-four hours. The first maximum takes place a short time after sunrise, and the second shortly after sunset; the first minimum shortly before sunrise, and the second in the afternoon, when the heat of the day is greatest. In cloudy

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weather the electroscope is affected sometimes positively, sometimes negatively, and is generally less influenced than in clear weather. The electricity of rain, snow, hail, etc., is sometimes positive, sometimes negative. In Stuttgart, for instance, it was found in the course of a year that the rain was 71 times positive to 69 times negative, and the snow 24 times positive to 6 times negative.

Sir William Thomson has made various observations on atmospheric electricity. His delicate electrometers give him not only great facility of observation, but their delicacy far transcends that of any instrument hitherto employed in such observations. Instruments such as his electrometers, that are sensitive to the electromotive force of a single Daniell's cell with any condensing contrivance, are a wonderful advance in observing power. Sir William's collecting apparatus is an insulated can of water placed inside a window, with a nozzle extending four feet and a half beyond the wall, the window being open only so far as to admit of the nozzle-tube passing without touching. The can, when the stop-cock is opened, assumes the potential of the air outside at the point where the jet breaks up into drops. In the portable electrometer for outside observations, he uses as the collector a burning match at the top of a long rod attached to the instrument. The collecting apparatus is, of course, insulated and connected with the electrometer. He estimates the amount of atmospheric electricity per foot or per inch. He calculates the difference of potential at the perpendicular distance, say, of a foot from any portion of the earth's surface, whether the level ground or an upright wall. He finds, as mentioned above, that the earth is always negative in clear weather, and the air positive, and that the difference of potential per foot is very different at different times. Thus, in the Isle of Arran, he found this to vary in ordinary fine weather from 22 to 44 Daniell's cells; with an e. or n.e. wind, the difference of potentials was from 6 to 10 times that per foot. He also finds sudden and unaccountable variations of potential within even comparatively few minutes, and he can suggest only that there may be cloudless yet cloud-like masses of clear air floating in the atmosphere, which are charged with electricity, and which in their passage over or near the electrometer give rise to these marked variations.

The cause of A. E. has given rise to much discussion. The electricity developed by evaporation and vegetation has been thought by some to account for the positive electricity of the air; but this view has been combated, and as yet no theory has been proposed, which satisfactorily accounts for it. For the electricity of the thunder-cloud, see LIGHTNING.

ATMOSPHERIC RAILWAY: railway on which the locomotive-power is supplied by the pressure of the atmosphere more or less directly on the carriages themselves. Vallance patented a plan for conveyance of passengers along a railway within an air-tight tunnel exhausted in front of a carriage working as a piston, the pressure of the

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atmosphere acting on the carriage from behind. This plan was made public in 1825, and ultimately brought into experimental operation at Brighton, proving the possibility of such a mode of transit. The general opinion as to its merits was, that though it might succeed in the transmission of goods, or, with a smaller tube than the tunnel, might suit well the conveyance of the mails, it could not be expected to enjoy the favor of the travelling public, on account of its dark, close tunnel. Thus the subject of atmospheric railways had ceased to attract attention, when the curiosity of the public was again called to it, by the proposal of another plan of propulsion, by Henry Pinkus, an American gentleman, resident in England, who took out a patent for it about the year 1835, under the name of the Pneumatic railway. The apparatus for this was to consist of a cast-iron tube of about forty inches diameter, having a slit of about two inches wide on its upper side, the slit (which was covered by a flexible flap or valve) furnishing an opening through which the mechanism of a piston working within the tube might be connected with that of the leading carriage without.

Under improved arrangements of the details, Messrs. Clegg and Samuda made an experiment of this plan in 1840, on a part of the line of the West London railway; and so favorable was the issue, that the directors of the Dublin and Kingston railway adopted the atmospheric pressure system for a projected extension of their line from Kingstown to Dalkey. Accordingly, parliamentary sanction was obtained for the line, and the first A. R. was in full operation at the beginning of 1844. In that year the London and Croydon railway company began to lay down a line of A. R. alongside of their locomotive line from London to Croydon. The South Devon railway company also adopted the atmospheric mode of working on a part of their railway. Both of these lines, however, were soon abandoned as unsatisfactory.

The result of these trials has clearly shown that the A. R. system cannot compete with the steam railway in ordinary travel. See PNEUMATIC DISPATCH.

ATOK, n. *ăt'ók* [S. Am. name]: variety of *Mephitis Americana*, found at Quito, whence Humboldt called it *Gulo Quitensis*. It is sometimes termed the Zorra.

ATOLL, n. *ăt'ól* [a Malayan word]: a coral island, consisting of a ring or circular belt, with a lagoon or lake in the centre. See CORAL ISLANDS.

ATOM, n. *ăt'ôm* [L. *atōmus*: Gr. *atōmos*, indivisible—from Gr. *a*, not; *temno*, I cut]: a particle of matter that cannot be made smaller; anything extremely small; the smallest quantity of an element which can enter into combination—as distinguished from a *molecule*, consisting of two or more atoms. ATOMED, a. *ăt'ômd*, small as atoms. ATOMIC, a. *ă-tôm'ik*, or ATOM'ICAL, a. *-î-kăl*, relating to atoms; consisting of atoms. ATOM'IC HEAT, term introduced by M. Regnault. The atomic heat of the elements in a solid state is nearly a constant quantity, the mean value being 6·4. This number is obtained by multiplying

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the specific heat of an element by its atomic weight. The atomic heat of an element represents the quantity of heat which must be imparted to or removed from atomic proportions of the several elements, in order to produce equal variations in temperature. **ATOM'ICALLY**, ad. -lī. **ATOMIST**, n. *ăt'ō-mĭst*, one who holds to the doctrine of atoms. **ATOMIZE**, v. *ăt'ō-mĭz'*, to reduce to atoms. **AT'OMIZER**, n. an instrument used for reducing a liquid into spray, for disinfecting, cooling, perfuming, and similar purposes. **AT'OMI'ZING**, imp. **ATOMIZED**, pp. *ăt'ō-mĭzd'*. **AT'OMLESS**, a. **ATOMISM**, n. *ăt'ō-mĭzm*, or **ATOM'ICISM**, the doctrine of atoms. **ATOMICITY**, n. *ăt'ōm-ĭs'ĭ-tĭ*, the power with which the atoms of one body can combine with the atoms of another. **AT'OMICITIES**, plu. -ĭ-tĭz. **ATOM'IC THE'ORY**, in *chem.*, the supposed resolution of bodies into ultimate particles or atoms, and the relative proportions in which they combine to form compound substances. **ATOMY**, n. *ăt'ō-mĭ*, an atom; an abbreviation for 'anatomy.'

AT'OM : an indivisible particle. In ancient philosophy, two theories of the nature of matter were recognized, and these have continued to form subjects of argument among speculative men since B.C. 510. One theory is, that matter is infinitely divisible. Thus, a needle may be divided into two, and each of the parts may in its turn be broken or cut into two, and each of the latter again and again be subdivided, till the parts become so small that it may be impossible to see them by the naked eye ; but these parts are regarded as capable of still further division, without limit or stoppage, provided more perfect or delicate means could be employed to act upon them. The second theory regarding the constitution of matter is, that in the repeated division and subdivision of a solid, liquid, or gas, a point will be reached at length when it will no longer be possible, by any conceivable means, to break a molecule in two, the molecule being a real unity, not composed of separable parts—in other words, an *atom*. The latter theory recognizes the finite divisibility of matter, and considers that all matter is more or less compactly built up of myriads of atoms aggregated together, and having spaces or pores between the several atoms or particles. If it were possible to subject such matter to the scrutiny of a sufficiently powerful magnifying-glass, or microscope, and thus exhibit or behold the atoms so separated by spaces, then an appearance would be presented similar to that which the painter chooses to depict on the canvas when he is representing a snow-storm, and where every little flake of snow is separated from its neighbor one by a space in which there are none; or that which would be observed if, during a hailstorm, some great power were to cry, 'Halt!' and that instant every minute hailstone was arrested in the spot it had reached.

This view of the physical nature of matter, known as the *atomic* or *corpuscular theory*, has in modern times received some support from the facts embodied in the chemical atomic theory originated by Dalton. Granting, however, that the chemist can prove that his simple and compound forms of matter are built up of chemical atoms, the prob-

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lem still remains to be solved as to the possible identity of physical and chemical atoms. What the chemist regards as an A. in his science, may not be an ultimate and indivisible A. in a physical point of view; the chemical A., though incapable of division as a chemical A., may still be composed or built up of many physical atoms, and may be capable of being subdivided into such. Indeed, while the atomic theory of Dalton, when first announced, was eagerly seized upon as the best possible evidence for the existence of both chemical and physical atoms, the tendency of recent researches and discussions in chemistry has been to show that the chemical A. is different from the physical, and does not necessitate the existence of the latter. See ATOMIC THEORY. According to the ordinary acceptance of the term, the chemical A. is a molecule of matter having a definite weight, magnitude, and form, possibly alike for the atoms of the same material, but differing in those of different substances. The form of an A. is supposed by some men of science to be the same as that which the fragments of a substance assume when it is split in the direction of the planes of the cleavage of its crystals (see CRYSTALLOGRAPHY); but a more general belief has been, that all atoms are spherical, and that the various crystalline forms are produced by the manner in which the atoms are grouped together. In regard to the size of atoms, Sir William Thomson has shown, by three entirely different trains of argument from observed facts, that the diameter of an A. cannot be greater than $\frac{1}{2500000000}$, nor less than $\frac{1}{50000000000}$ of an inch. See MATTER: VORTEX.

ATOMIC THEORY, in Chem.: a theory as to the ultimate constitution of material bodies. Analysis shows that compound bodies contain certain elements (see CHEMISTRY) in certain proportions. These proportions have been minutely examined by chemists since the time when the balance was first applied to chemical investigation, and it has been proved that the respective quantities of each of the combining elements are not dependent entirely upon external conditions, but are regulated by certain laws. These laws were partially observed and discussed by earlier chemists and physicists, but it was reserved for Dalton (q.v.), systematizing the somewhat incoherent labors of his predecessors, to announce, in positive language, the four laws which regulate the union of various kinds of substances, and which are still acknowledged by chemists as the LAWS OF COMBINING PROPORTION, or the Atomic Theory. These laws regulate the combination of unlike substances by *weight*, and not by *volume*; and they are based upon the preliminary acknowledged fact, capable of experimental demonstration, that the same compound substance is always composed of the same ingredients or elements.

The *first law* of combination by weight comprehended under the A. T. is THE LAW OF CONSTANT PROPORTION, which teaches that the elements or ingredients which form a chemical compound are always united in it in the same proportion by weight. Thus, water, which consists of oxygen and hydrogen, does not contain one or both of these

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elements in indefinite amount, but it is invariably made up of 8 parts by weight of oxygen to 1 part by weight of hydrogen. It makes no difference whether the total amount of either element be represented by grains, ounces, pounds, or tons, it will always be found that the proportion of 8 parts of oxygen to 1 part of hydrogen is kept up. Neither does the source of the water make any difference, for pure water obtained from rain, snow, or hail, the river or the sea, the sap of plants or the juices of animals, invariably contains the same elements in the same proportions. Again, common salt (chloride of sodium), whether it be obtained from sea-water, salt-springs, rock-salt, or even the blood of animals, always consists of chlorine and sodium in the exact and never-varying proportion of $35\frac{1}{2}$ parts of chlorine to 23 parts of sodium. While the law of constant proportion teaches that the same compound is always built up of the same ingredients in the same proportion, it does not necessarily follow that the same elements or components in the same proportions will invariably form the same compound body. It is far otherwise; and many examples can be obtained, especially from organic chemistry, where the same components in the same proportions produce very different substances. Thus, starch and cotton (lignine)—very dissimilar substances—consist of carbon, hydrogen, and oxygen in the very same proportions; and gum-arabic and cane sugar are similarly circumstanced. See ISOMERIC BODIES.

The *second law* is the LAW OF RECIPROCAL PROPORTION, which teaches that the proportions in which two substances unite with a third have a simple arithmetical relation to that proportion in which they unite with each other. Thus oxygen and hydrogen unite in the proportion of 8 to 1 to form water. Carbon and hydrogen are present in olefiant gas in the proportion of 6 to 1, and oxygen and carbon unite in the proportion of 8 to 6 to form carbonic oxide. Again we have a compound of oxygen and iron containing these elements in the proportion of 8 to 28; we have also a compound of sulphur and iron in the proportion of 16 to 28; and sulphur and oxygen unite together to form sulphurous acid gas, which contains equal weights of the two elements—the proportion of 1 to 1 having a simple arithmetical relation to the proportion 8 to 16.

Numbers representing the proportions in which the elements combine (such as 1 for hydrogen, 8 for oxygen, 6 for carbon, 16 for sulphur, 28 for iron, etc.), are called their 'combining proportions,' or *Atomic Weights* (q.v.). It is obvious that analysis alone cannot enable us to fix definitely such numbers. There is nothing in the *composition* of their compounds to lead us to adopt the proportional numbers given above for hydrogen, oxygen, carbon, sulphur, and iron, rather than simple multiples or sub-multiples of them. In fact, the numbers adopted by Berzelius, and now reintroduced, are in the proportion—hydrogen 1, oxygen 16, carbon 12, sulphur 32, iron 56. For the reasons for preferring certain particular numbers to any multiples or submultiple of them, see CHEMISTRY.

The *third law* is THE LAW OF MULTIPLE PROPORTION,

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which is, that when one substance combines with another in several proportions, the higher proportions are multiples of the first or lowest. Thus, hydrogen unites with oxygen in two proportions; as 1 of hydrogen to 8 of oxygen, when ordinary pure water is the result of union; and as 1 of hydrogen to 16 of oxygen, when peroxide of hydrogen, a powerful bleaching agent, is produced—the difference in the respective amounts of the oxygen—8 and 16—being, that the latter is a multiple of the former by 2. Again, carbon unites with oxygen in two proportions: as 6 of carbon to 8 of oxygen, when the inflammable gas, carbonic oxide, is formed; and as 6 of carbon to 16 of oxygen, when the non-inflammable gas, carbonic acid, is the result. The variation in this instance is, that the oxygen is present in the one case as 8, and in the other as a multiple of that number by 2, viz. 16. One of the best illustrations of this law is in the union of nitrogen and oxygen: 14 parts of nitrogen can unite with 8 of oxygen, and thus form laughing-gas; but the same amount of nitrogen can combine with 16, 24, 32, or 40 of oxygen—in the latter case constituting anhydrous nitric acid—all of the higher numbers being multiples of the first or lowest, viz. 8 by 2, 3, 4, and 5.

The *fourth law* is THE LAW OF COMPOUND PROPORTION, which teaches that the combining proportion of a compound substance is the sum of the combining proportions of its components. Thus, the compound body, carbonic acid, which consists of 6 of carbon united with 16 of oxygen, has the combining proportion 22, which is the sum of the combining proportions of the carbon and oxygen composing it, viz. $6 + 16 = 22$. Similarly, the compound substance lime contains 20 of the metal calcium combined with 8 of oxygen, and has the combining proportion of $20 + 8$ or 28. When carbonic acid and lime are linked together, as in marble, which is the carbonate of lime, then they are united in the proportion of 22 parts of carbonic acid and 28 of lime. Not only is 22 the proportion in which carbonic acid will combine with lime, but it is the proportion in which it will form compounds with every other substance of similar chemical constitution.

The preceding laws regulating the union of substances by weight have been obtained by comparing together the results of numerous experiments, and every careful analysis serves to confirm their accuracy. But Dalton's theory was not limited to the statement of these laws; it was also an attempt to explain them. It assumes that each elementary substance consists of extremely small indivisible particles or atoms; that the atoms of any one element are all exactly alike, but differ from the atoms of every other element. Among other points of difference, they differ in weight, and although the absolute weight of an atom is unknown, the weights of two atoms, one of one element, the other of another element, are in the proportion of the combining weights of the elements they belong to. Thus the combining weight of sulphur is twice that of oxygen: the absolute weight of an atom of either is not known; but the A. T. assumes that each atom of sulphur is twice as heavy

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as an atom of oxygen. Further, Dalton's theory assumes that the ultimate particles of compound bodies contain a comparatively small number of atoms of the component elements. It is easy to see how this theory explains the laws enunciated above. It must, however, be remembered that while the theory satisfactorily explains the laws, the laws do not prove the theory. It is quite conceivable that such laws might exist, although matter did not consist of atoms. The A. T., however, rests not only on a chemical, but also upon a physical, foundation. According to the modern molecular theory, matter consists of small particles, each of which is in motion, and this motion is the more rapid the hotter the substance is. These small particles or 'molecules' cannot be broken up without changing the character and properties of the substance. They are not, however, *atoms*. In the case of compounds, as the molecules of any *one* substance are all similar to one another, each molecule must contain all the components; and in many elementary substances it can be proved, assuming the truth of the molecular theory, that each molecule consists of several similar atoms. A molecule, then, is either a single atom, as in *some* elementary substances, or a group of atoms which remain together during those movements which depend on the temperature of the substance. Now, the velocity of these motions increases as the temperature is raised; when, therefore, the temperature is raised so high, and the velocity of the molecules becomes so great that the collision of the molecules with one another is sufficiently violent to break them up and separate their constituent atoms, the substance is decomposed, the atoms rearranging themselves into new groups (or molecules) capable of remaining unbroken under the new conditions. This explains the decomposition of compounds by the action of heat.

When the temperature is not so high, and the violence of collision insufficient to break up the molecules, these are merely shaken, thrown into a state of vibration, and thus the hold of the atoms upon each other is loosened. Now, if two substances are mixed together, it may happen that some atoms in the one set of molecules are so attracted by some atoms in the other set, that, when a molecule of the one set meets one of the other set in a vibrating or loosened condition, an exchange of atoms may take place between them, or each may lose a part of its atoms, these going to form a new molecule. This gives an explanation of the action of one substance upon another, and further shows why, in general, a certain temperature is required in order that the action may take place.

Gay Lussac first pointed out that a relation exists between the density of a gas and its atomic weight. Avogadro greatly simplified the statement of these relations by announcing the law of molecular volumes of gases, a law which Prof. Clerk Maxwell has since proved to be a necessary consequence of the molecular theory of gases. This law is, that a given volume of gas at a given temperature and pressure contains the same number of molecules whatever be the nature of the gas.

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From this law, to which may be given the name of 'Avogadro's law,' and from Boyle's law, and the law (often called Charles's law) that the volume of a gas is directly proportional to the absolute temperature—that is, to its temperature reckoned from a point 273° centigrade below the freezing-point of water—it follows that the volume occupied by a given mass of a gas is a function of the pressure, the temperature, and the molecular weight of the gas; understanding by the 'molecular weight' of a substance a number M , such that $M:2::$ the absolute weight of a molecule of the substance: the absolute weight of a molecule of hydrogen. The number 2 appears in this proportion because we assume the *atom* of hydrogen as our unit both of atomic and of molecular weight, and it can be proved (see CHEMISTRY) that the molecule of hydrogen gas consists of two atoms. If, then, P be the pressure in millimetres of mercury at 0° C; t , the temperature of the gas, as indicated by a centigrade thermometer; M , the molecular weight of the substance; and V , the volume (in cubic centimetres) occupied by a gramme of the gas,

$$V = \frac{760}{P} \times \frac{t \times 273}{273} \times \frac{22400}{M}.$$

In the gaseous state, the

average distance between the molecules, although extremely small, is great compared with the size of the molecules, so that the volume of the gas depends almost exclusively upon the distance between the molecules; it is not so in the case of solids and liquids, in which the molecules are so closely packed as to be almost always in contact. The volume occupied by solids and liquids depends, therefore, far more upon the *atoms* of which the substance is made up, than upon its *molecular* structure. For further recent modifications of the A. T., see MATTER; CHEMISTRY.

ATOMIC VOLUMES: see ATOMIC THEORY: CHEMISTRY.

ATOMIC WEIGHTS: the proportions by weight in which the various elementary substances unite together. It is necessary that one element be selected as the starting-point of the series, and an arbitrary sum affixed to it, and thereafter all the other elements can have their sums awarded to them, according to the proportional amounts in which they combine with each other. The *second law*, mentioned under the ATOMIC THEORY (q.v.), explains the manner in which this can be done, and how far the numbers are arbitrary. In all systems of atomic weights in modern use, the atomic weight of hydrogen is taken as unity, and the atomic weights of the other elements are then fixed, so as to give on the whole the simplest and most consistent formulæ for their compounds.

There are two systems of atomic weights at present in use: First, The 'old' system, which, after much discussion, was generally adopted about 1845; and, second, the new system, which is, in many respects, a revival of the system of Berzelius, and came into general use by scientific chemists about 1860. For the reasons for the change of atomic weights, see CHEMISTRY: also ELEMENTS, CHEMICAL.

ATOMIC WEIGHTS.

ELEMENTARY SUBSTANCES, WITH THEIR SYMBOLS AND
ATOMIC WEIGHTS.

NAME OF ELEMENT.	Symbol.	ATOMIC WEIGHTS.	
		Old.	New.
Aluminium.....	Al	13·7	27·4
Antimony (Stibium).....	Sb	120·4	120·4
Arsenic.....	As	75·0	75·0
Barium.....	Ba	68·5	137·0
Bismuth	Bi	208·0	208·0
Boron.....	B	11·0	11·0
Bromine.....	Br	80·0	80·0
Cadmium.....	Cd	56·0	112·0
Cæsium.....	Cs	133·0	133·0
Calcium.....	Ca	20·0	40·0
Carbon	C	6·0	12·0
Cerium.....	Ce	46·0	139·0
Chlorine.....	Cl	35·5	35·5
Chromium.....	Cr	26·0	52·0
Cobalt.....	Co	29·5	59·0
Copper (Cuprum).....	Cu	31·7	63·4
Didymium	Di	47·5	95·0
Erbium.....	Er	87·5	165·0
Fluorine.....	F	19·0	19·0
Gallium.....	Ga		68·0
Glucium (Beryllium).....	G	4·7	9·4
Gold (Aurum)	Au	196·0	196·0
Hydrogen.....	H	1·0	1·0
Indium	In	37·8	113·0
Iodine.....	I	127·0	127·0
Iridium.....	Ir	99·0	198·0
Iron.....	Fe	28·0	56·0
Lanthanum	La	68·5	137·0
Lead (Plumbum).....	Pb	103·5	207·0
Lithium... ..	Li	7·0	7·0
Magnesium	Mg	12·0	24·0
Manganese	Mn	27·5	55·0
Mercury (Hydrargyrum)..<	Hg	100·0	200·0
Molybdenum	Mo	48·0	96·0
Nickel	Ni	29·5	59·0
Niobium	Nb	94·0	94·0
Nitrogen.....	N	14·0	14·0
Osmium.....	Os	100·0	200·0
Oxygen.....	O	8·0	16·0
Palladium.....	Pd	53·0	106·0
Phosphorus	P	31·0	31·0
Platinum.....	Pt	99·0	198·0
Potassium (Kalium)	K	39·0	39·0
Rhodium.....	Rh	52·0	104·0
Rubidium	Rb	85·4	85·4
Ruthenium.....	Ru	52·0	104·0
Selenium.....	Se	39·5	79·0
Silicon.....	Si	14·0	28·0
Silver (Argentum).....	Ag	108·0	108·0
Sodium (Natrium).....	Na	23·0	23·0
Strontium.....	Sr	43·8	87·6
Sulphur ..	S	16·0	32·0
Tantalum.....	Ta	182·0	182·0
Tellurium.	Te	64·0	128·0
Thallium.....	Tl	204·0	204·0
Thorium.....	Th	57·8	115·6
Tin (Stannum).....	Sn	59·0	118·0
Titanium.....	Ti	25·0	50·0
Tungsten (Wolfram).....	W	92·0	184·0
Uranium	U	60·0	240·0
Vanadium.....	V	51·3	51·3
Yttrium ..	Y	41·2	88·3
Zinc ..	Zn	32·5	65·0
Zirconium.....	Zr	41·8	89·6

ATONE—ATONEMENT.

ATONE, v. *ă tōn'* [from *at one*, denoting to be, or to cause to be, at one]: to turn again from the wrong to the right; to agree; to make amends; to give satisfaction for an offense or a crime; to expiate by sacrifice; to reconcile; to appease. **ATON'ING**, imp : **ADJ.** making amends or satisfaction. **ATONED**, pp. *ă-tōnd'*. **ATONEMENT**, n. *ă-tōn'-mēnt*, reconciliation after enmity; satisfaction; expiation; an expiatory sacrifice. **ATON'ER**, n. one who.

ATONEMENT, in Theol.: the reconciliation of man with God. Sin violates the ground of union which the personal creature has, by nature, with the holy God. The act of sin is one of separation; the act begets the state of sin, the state confirms and repeats the act. The doctrine of the A. treats of the mediation necessary for restoring the union between God and man, which has been lost by sin. The A., therefore, must ever be the fundamental doctrine in every religion of sinful creatures. In the Christian religion, it manifestly occupies this central position; for the Christian doctrine of the A. is but the explanation of its great historic fact—the embodiment in one person of the divine and human natures in perfect agreement. In the person of Christ, God and man are atoned or made to be *at one*: Christ is their Atonement.

So fundamental is the doctrine of the atonement in the Christian religion, that it does not, like many other doctrines, form a ground of distinction among the great bodies into which the Christian world has been divided. All historic churches may be said to be equally orthodox on this point. The Church of Rome, the Greek Church, the various Protestant churches with the exception of some temporary and unimportant sects, with doctrines scarcely recognizable as within the bounds of Christianity—all agree, taking their standards as a criterion, in resting the sinner's hope of salvation on the mediatorial work or atonement of Jesus Christ. Nevertheless, there have been from the beginning of speculative Christian theology, and continue within the several churches, various ways of conceiving and explaining the exact nature and mode of operation of this mediatorial work. What follows is a brief sketch of the historical development of these speculations.

Christianity differs from heathenism in the clear perception which it has of the antagonism that sin has introduced between God and man. Heathenism but vaguely conceives of this variance, and consequently has but an ill-defined notion of the atonement required, the notice seldom containing more than the idea of a reconciled union of the individual man with nature and the universal life. Even where its mythical divinities assume personality, it is but an ideal personality without any concrete reality of life, and consequently without any real significance for the conscience. In this state the abject subjection of man to outward nature, or to the visible system of things, prevents his rising into that sphere of conscious freedom which shows sin sinful, and demands an A. with one who is Lord both of nature and man.

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In Judaism, man stands above outward nature, in conscious relation to a personal God, whose written law exhibits the requirements of his relationship with man—requirements which are never met, and which only make him fearfully conscious of the ever-widening breach between him and his God. Thus the law awakened the sense of guilt, and the desire for an A.; a desire that it could never satisfy. The never-ceasing demands of these ever-unfulfilled requirements were constantly acknowledged by its whole sacrificial *cultus*, which expressed the hidden ground of Jewish hope, and prophetically pointed to its future manifestation.

But though the Holy Scriptures, throughout the Old Testament, exhibit the making of an A. by vicarious sacrifice (Lev. xvi. 21; xvii. 11); and though the idea, both of the suffering and the deliverance of many by the sins and virtues of one, was common to all antiquity, the idea of the suffering and vicarious Messiah, plainly declared in the writings of the prophets (Luke, xxiv. 46; Isaiah, liii.; Psalm xxii.), and not entirely hidden from the more thoughtful and devout contemporaries of Jesus (Luke, ii. 34; John, i. 29), was foreign to the Messianic faith of the great body of the people.

In the New Testament, Christ is everywhere exhibited as one sent from God for the salvation of the world (John, iii. 16, 17); and as the condition, on the part of man, of his obtaining this salvation, we read of the requirement of repentance, faith, and reformation (Matt. iv. 17; v. 3, 11; vi. 12; Mark, xvi. 16; Luke, xv. 11), while, on the part of God, as conditioning and mediating his forgiveness of sins, we have exhibited the entire life of Christ upon earth conceived of as embracing severally its individual features (Acts i. 31; Rom. iv. 25; viii. 34); but more especially his death as a ransom for our sins (Matt. xx. 28; xxvi. 28), as a vicarious sacrifice (1 Peter, i. 19; 2 Cor. v. 21), by which we are redeemed from the bondage of sin (1 Tim. ii. 6; Gal. iii. 13; 2 Peter, ii. 1), and obtain forgiveness (1 Tim. v. 19; 1 Cor. xv. 3; 1 John, i. 7), and eternal life and peace with God (John, x. 11, Col. i. 20). Christ is therefore the Mediator between God and man (1 Tim. ii. 5), having made peace through the blood of his cross (Col. i. 20); the propitiation for our sins (1 John, ii. 2; iv. 10); and our high-priest who offers himself a sacrifice to reconcile us with God (Heb. ii. 17; v. 1; ix. 28). Moreover, we are also taught that God has in Christ reconciled the world with himself (Rom. v. 10; Col. i. 22; 2 Cor. v. 19).

In accordance with this full and explicit teaching of Holy Scripture, we find that the sufferings and death of Christ were ever regarded as of primary and essential importance in his work of redemption; notwithstanding, we look in vain through the early centuries of the Christian Church for anything like a systematic development of the doctrine of the Atonement. The germs of the doctrine existed, but without any logical connection or clearness. It was the *fact* of the A. in Christ that was made prominent and

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central. 'On this head there has been a twofold mistake—sometimes the existing beginnings of many later elaborated dogmas have been overlooked; or, on the other hand, it has been attempted to point out with literal distinctness church doctrines as if already developed.' The early church fathers dwell with a sort of inspired devotion upon those facts of the gospel which represent Christ as the sacrifice for our sins, as the ransom paid for our redemption, as our deliverer from the power of Satan, as the restorer to mankind of whatever was lost by the fall of Adam; but they seldom attempt to show *how* these blessed results connect themselves with the sufferings and death of Christ; neither do they show in what manner the A. has objectively been made, nor how it is brought to the experience of its individual subjects.

In many ways the sufferings and death of Christ were regarded in relation to their A. for sin. During the first four centuries there appeared no certainty of opinion as to whether they were a ransom price paid to God or to the devil. The latter supposition was the more prevalent, shared by Origen and St. Augustine. Gregory of Nyssa explains this opinion by saying that the devil consented to receive Jesus as a ransom, because he regarded him as more than an equivalent for all those under his power; but that, notwithstanding his subtility, he was outwitted, for, owing to the humiliation in which Christ was veiled, he did not fully recognize him as the Son of God, and consequently was himself deceived. But having consented to receive him as a ransom for mankind, he was righteously deprived of his dominion over man, while he could not retain Jesus when he discovered him to be the Holy One of God, being horrified and tormented by his holiness.

Athanasius first of all successfully controverted this notion, and maintained that the ransom was paid to God. He argued that as God had threatened to punish transgressors with death, he could but execute his threat. But then it was not becoming the character of God to allow his purpose in the creation of man to be frustrated by an imposition practiced upon him by the devil. The only expedient, therefore, which remained for his deliverance from death was the incarnation and sacrifice of the Logos in his stead, by which the justice and veracity of God would be maintained, man delivered, the law fulfilled, and the power of the devil broken. It has often been stated that Tertullian uses the term satisfaction with respect to Christ's A. for sin, but this is incorrect, for although he employs the term, he never does so in the sense of a vicarious satisfaction, but only in the sense of making amends for our own sins by confession and repentance.

These elemental and mythical conceptions of the doctrine of the A. remained in a most imperfect and altogether undeveloped condition, until the acute and subtle genius of the Piedmontese Abp. of Canterbury reduced them to order, and presented them in logical consistency. Anselm, therefore, must be regarded as the author, at least as to its form, of the doctrine of vicarious satisfaction,

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which, under various modifications, has ever since continued as the 'orthodox' doctrine of the church. The following is, in all essential respects, his statement of the doctrine: The infinite guilt which man had contracted by the dishonor of his sin against the infinitely great God, could be atoned for by no mere creature; only the God-man, Christ Jesus, could render to God the infinite satisfaction required. God only can satisfy himself. The human nature of Christ enables him to incur, the infinity of his divine nature to pay, this debt. But it was incumbent upon Christ as a man to order his life according to the law of God; the obedience of his life, therefore, was not able to render satisfaction for our guilt. But although he was under obligation to live in obedience to the law, as the Holy One he was under no obligation *to die*. Seeing, then, that he nevertheless voluntarily surrendered his infinitely precious life to the honor of God, a recompense from God became his due, and his recompense consists in the forgiveness of the sins of his brethren, the race of man.—In this form of the doctrine we are taught the necessity of an active vicarious satisfaction; but Anselm nowhere teaches the passive satisfaction, he nowhere says that Christ endured the punishment of men. Nor do we find in his writings the development of the subjective side of the doctrine—namely, how the satisfaction rendered to God mediates the A. in the experience of the believer.

After the time of Anselm, and before the Reformation, two views of the A. divided the opinions of the church: one regarding the peculiar manner in which it was accomplished as absolutely necessary, and deriving its efficiency from its objective nature; the other supposing a subjective connection between the sufferings of Jesus and the price of redemption, because this was best fitted to effect the moral transformation of men. According to Anselm, the satisfaction rendered by Christ was greater than the guilt for which he atoned; and it needed to be greater, for the payment of the debt due to God gave men no claim to the favor of God. Thomas Aquinas and his followers maintained Augustine's opinion of the infinite value of the blood of Christ rendering it more than sufficient; while the Scotists maintained that it was sufficient only because God was pleased to regard it as sufficient. But in the period between Anselm and the Reformation, little or no progress was made in the development of this doctrine.

We come now to the period of the Reformation, when the objective speculations of the schoolmen are brought under the subjective requirements of human souls, and the doctrine of the A. is viewed in this light. In the writings of Luther, one will only with difficulty arrive at his intellectual apprehension of this doctrine in its scientific form; but setting out with the consciousness of sin, one will everywhere discover his firm conviction that in Christ all sin is 'vanquished, killed, and buried, and righteousness remaineth a conqueror and reigneth for ever.' The following is an outline of the Lutheran doctrine, as laid down in the *Con-*

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cordienformel: It is only by faith that we can receive the blessings presented to us in the gospel by the Holy Ghost. Faith justifies, because it appropriates the merit of Christ. Therefore, the righteousness which is imputed to the believer, simply by the grace of God, is the obedience, the suffering, and the resurrection of Christ, by which he has satisfied the claims of the law, and atoned for our sins. For as Christ is not merely man, but God and man in one person, he was, as Lord of the law, no more subject to it than he was subject to suffering and death. For this reason, his two-fold obedience—that which he rendered, on the one hand, by his suffering and death, and, on the other, by his righteous fulfilment of the law on our behalf—is imputed to us, and God acquits us of our sins, and regards us as just, in view of his complete obedience in what he did and suffered. This obedience embraces the entire existence of Christ upon earth, and is so complete that it fully covers the disobedience of men, so that their disobedience is not reckoned against them for condemnation. Therefore, Christ is our righteousness only so far as in his entire person the most perfect obedience is exhibited, which he was able to render in that he was neither God alone nor man alone, but both in one, God and man.

According to Calvin: if one asks how Christ has reconciled us with God, and purchased a righteousness which made him favorable to us, it may be answered generally, that Christ accomplished this by the whole course of his obedience. But although the life of Christ is to be regarded as paying the price necessary for our deliverance, the Scriptures ascribe our redemption especially to his death. Calvin attached great importance to the particular mode of his death—any other mode of death would not have rendered the same satisfaction to God. He, however, says little or nothing about Christ's fulfilling the law for us, but dwells upon his delivering us from its curse. He does not, therefore, exhibit his active obedience separated, as an essential part of his satisfaction for sin, from his passive obedience. The importance attached to the obedience of his life arises from its natural and necessary connection with his suffering and death. And the great importance attached to his death is drawn rather from the view of its subjective necessity, than from the idea of the divine righteousness—namely, that without such a death there would have been no sufficient ground for the subjective realization of deliverance from sin and guilt. Calvin's view differs from that of the Lutheran *Concordienformel* in that he does not regard the relationship of God to man merely from the standpoint of punitive and satisfying righteousness, which always leads to the merely negative notion of a Redeemer from guilt and punishment, but looks upon Christ as the highest Mediator, through whom the nature of God is communicated to man. There was a necessity for Christ's incarnation, not merely because, apart from the suffering of the God-man, the divine righteousness could not be atoned, but also because, without such a divine Mediator, there could be no vital relation between

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God and man. 'Had man remained free from all taint, he was of too humble a condition to penetrate to God without a Mediator.'

While the reformers established the doctrine of the A. on the theory of Anselm, and extended it so as to make the sufferings of Christ include the divine curse, and introduced distinctions between Christ's active and passive obedience, Socinus endeavored to prove the falseness of Anselm's theory. He shared with the Protestants the subjective principle, which the period of the Reformation established, but developed it in a one-sided manner. Socinianism represents man as attaining to oneness with himself and with God by his own moral energy. It rejects that idea of the righteousness of God which makes it impossible for him to forgive sin without a satisfaction, as imposing finite limitations upon the divine Being; and also objects to the doctrine of satisfaction, on the ground that satisfaction for sin and forgiveness of sin are incompatible with each other; and, moreover, objects that sin and punishment are of so personal a nature as not to allow of their being transferred. It further opposes the doctrine of the active and passive obedience of Christ, on the ground that the one excluded the other. Another objection maintained the actual impossibility of Christ's rendering the supposed satisfaction for sin.

The doctrine which it sought to establish in the place of the one it attempted to overthrow may in brief be stated as follows: Man is reconciled to God by repentance and reformation. Only from an act of man changing his disposition, and not from an act of God changing his relation to man, follows his reconciliation with God. God is in himself ever the same towards man—reconciled from all eternity; man alone has to assume a new relation; as soon as he does this, he is immediately reconciled; by this act of his will, he is at one with God. Only in man's moral state is there any obstacle to his reconciliation. This greatest and holiest accomplishment, the reconciliation of man with God, is achieved by an act of his will.

In this purely subjective theory, repentance occupies the place of faith in the orthodox doctrine, and faith becomes identical with obedience; for repentance and reformation are regarded as but the two sides of the same act of the will. It follows from this that justification is of works as well as reconciliation. A necessity for the sufferings of Christ is shown for the following objects—that he might become our example; better fitted to render us help; that we might have a pledge and guarantee of the divine forgiveness; and as conditioning his resurrection and ascension to glory.

We must now hasten to the form of this doctrine among 'Modern Calvinists,' without attempting further to exhibit the links in the chain of its historic connection. 'Modern Calvinism' represents the A. as that satisfaction for sin which was rendered to God, in his public character as moral governor of the world, by the perfect obedience unto death of our Lord Jesus Christ. The nature of this satisfaction

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was a moral, not a pecuniary satisfaction. It preserves to the moral government of God its authority, while its tendency is to procure the forgiveness of sin. The value of the sufferings of Christ consists in their tendency to uphold the divine moral government unimpaired while pardon is extended to those who have violated it, rather than in the intrinsic excellence of those sufferings, which, though essential to, did not constitute their value. There was a moral necessity for Christ's sufferings and death—obstacles to the bestowment of pardon had to be removed—the influence of the Holy Spirit had to be secured. The whole contents of Christ's earthly existence, embracing both his active and passive obedience—a distinction unsupported by the word of God—must be regarded as contributing to the A. which he made. Of the actual sufferings of Christ immediately attending his death, it is not allowable to speak with confidence, so little has been revealed. It may, however, be considered—whether the Saviour's deprivation of his Father's countenance may not have been indirectly caused rather by his awful and afflicting sense of the evil of sin, than otherwise.—As to the 'extent' of the A., there is a broad distinction to be made between the *sufficiency* of the A., and its *efficiency*. It may be true that Jehovah did not intend to exercise upon all men that influence of the Holy Spirit which is necessary to secure the salvation of any one, but as the A. was to become the basis of moral government, it was necessary that it should be one of infinite worth, and so in itself adequate to the salvation of all. The body called Universalists (q.v.) hold both the efficiency and ultimate sufficiency of this great event in history.

The foregoing represents the modified view of the doctrine as advocated by Dr. Payne, and as held, in all essential respects, by such men as Pye Smith and Wardlaw, which, in its earlier form, and as found in the writings of Owen and Edwards, maintains that the A. was made only for the elect; and that its necessity with respect to them arose out of the eternal justice of God, which required that every individual should receive his due desert; and, consequently, that the sufferings of Christ were the endurance of punishment equivalent in amount or value of suffering, if not identical in nature—as Owen maintains—with that to which the elect were exposed; and, moreover, that the meritorious obedience of Christ in fulfilling the law imputes a righteousness to those for whom the A. secures salvation, which gives them a claim to the reward of righteousness.

The doctrine of the A. has taken various forms in the philosophic theology of Germany from Kant to the present time. See NEANDER. Passing by these, we may attend to some leading forms of the doctrine advocated during recent years, which may fairly represent present opinion.

Let us begin with the view of modern Unitarianism, which may very clearly and fairly be presented in the words of one of the most able of its advocates, the Rev. Prof. John James Tayler: “There is *one* mediator between

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God and men, the man Christ Jesus." This can only refer to unrivalled pre-eminence, not to exclusive function. For all higher minds do, in fact, mediate between their less gifted fellow-creatures and the great realities of the invisible world. This "*one*" is a *human* mediator, "the man Christ Jesus"—not a being from another sphere, an angel or a God—but a brother from the bosom of our own human family. "He gave himself a ransom for *all*" who embrace his offers and will hearken to his voice. He brings from God a general summons to repent; and with that he conveys, through faith, a spiritual power to shake off the bondage of sin, and put on the freedom of a new heart and a new life. He is a deliverer from the power of sin and the fear of death. This is the *end* of his mediation. This is the redemption of which he paid the price. His death, cheerfully met in the inevitable sequence of faithful duty, was only one among many links in the chain of instrumentalities by which that deliverance was effected. It was a proof such as could be given in no other way, of trust in God and immortality, of fidelity to duty, and of love for mankind. In those who earnestly contemplated it, and saw all that it implied, it awoke a tender response of gratitude and confidence, which softend the obdurate heart, and opened it to serious impressions and the quickening influences of a religious spirit.'

Prof. Jowett advocates an opinion peculiarly his own, if, indeed, language so confessedly vague and indefinite can be said to embody an *opinion*. It is this: 'That the only sacrifice, A., or satisfaction with which the Christian has to do, is a moral and spiritual one; not the pouring out of blood upon the earth, but the living sacrifice "to do thy will, O God;" in which the believer has part as well as his Lord; about the meaning of which there can be no more question in our day than there was in the first ages.'—'Heathen and Jewish sacrifices rather show us what the sacrifice of Christ was not, than what it was. They are the dim, vague, rude, almost barbarous expression of that want in human nature which has received satisfaction in him only. Men are afraid of something; they wish to give away something; they feel themselves bound by something; the fear is done away, the gift offered, the obligation fulfilled in Christ. Such fears and desires can no more occupy their souls; they are free to lead a better life; they are at the end of the old world, and at the beginning of a new one.'—The work of Christ is set forth in Scripture under many different figures, lest we should rest in one only. His death, for instance, is described as a ransom. It is not that God needs some payment before he will set the captives free. Ransom is deliverance to the captive. 'Whosoever committeth sin is the servant of sin.' Christ delivers from sin. 'If the Son shall make you free, ye shall be free indeed.' 'To whom? for what was the ransom paid? are questions about which Scripture is silent, to which reason refuses to answer.

A remarkably original work on the Atonement was issued several years ago, by the Rev. John M'Leod Camp-

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bell. His views are as follows: The work of the Son of God who came to do and did the will of his Father, must, in view of the deliverance which he wrought, be regarded as twofold: first, as dealing with man on behalf of God, and second, as dealing with God on behalf of man.

In dealing with man on behalf of God, Christ revealed to us the Father in his relation to a sinful world, showed us what our sins were to God, vindicated in the world the Father's name, and witnessed to the excellency of that will against which we were rebelling. In thus revealing the will of the Father towards sinful men, he necessarily became a man of sorrow and suffering, but these arose naturally out of what he was, and the relation in which he stood to those for whom he suffered; and to the holiness and love of his very nature must we refer their awful intensity and immeasurable amount. He suffered what he suffered, through seeing sin and sinners with God's eyes, and feeling in reference to them with God's heart. By what he suffered, he condemned sin, and revealed the wrath of God against it. His holiness and love taking the form of suffering, compose the very essence and adequacy of his sacrifice for sin.

Again, in dealing with God on behalf of man, the oneness of mind with the Father which towards man took the form of condemnation of sin, became in his dealing with the Father in relation to us a perfect confession of our sins, which was a perfect Amen in humanity to the judgment of God on the sin of man. Such an Amen was due in the truth of all things, due on our behalf, though we could not render it, due from him as in our nature and our true brother. He who was the truth, could not be in humanity and not utter it; and it was necessarily a first step in dealing with the Father on our behalf. This confession of our sins by him who, as the Son of God and the son of man in one person, could perfectly measure and know the evil of man's alienation, was a peculiar development of the holy sorrow in which he bore the burden of our sins; and which, like his sufferings in confessing his Father before men, had a severity and intensity of its own. But apart from the sufferings present in that confession, this Amen from the depths of the humanity of Christ to the divine condemnation of sin, is necessarily conditioned by the reception into the bosom of the divine humanity, of the full apprehension of the wrath of God, as well as of the sin against which that wrath comes forth into his soul and spirit; and, so receiving it, he responds to it with a perfect response, and in that perfect response he absorbs it. For that response has all the elements of a perfect repentance in humanity, for all the sin of man—a perfect sorrow—a perfect contrition—all the elements of such a repentance, and that in absolute perfection; all—excepting the personal consciousness of sin—and by that perfect response or Amen to the mind of God, in relation to sin, is the wrath of God rightly met, and that is awarded to divine justice which is its due, and could alone satisfy it.

This confession of the world's sin by the Head and Rep-

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representative of humanity, was followed up by his intercession as a part of the full response of the mind of the Son to the mind of the Father—a part of that utterance in humanity which propitiated the divine mercy by the righteous way in which it laid hold of the hope for man which was in God. ‘He bore the sins of many, and made intercession for the transgressors.’

The Rev. F. D. Maurice professed to hold a purely biblical theology, as opposed to the theologies of consciousness, which he repudiates. He seeks his doctrine of the A. in the answer which the Bible gives to the demands of a sin-smitten conscience. A sinner requires, and is content to be told on the authority of Scripture, that the Son of God has taken away sin. This message from God is the gospel for all men. The sinner wants to be assured that God has spoken, that he has declared himself the Reconciler, and desires to be shown how and in whom he has accomplished that work on his behalf.

To this question—How and in whom the work of reconciliation has been accomplished?—Mr. Maurice replied, in effect and almost in words as follows: The will of God is set forth in the Bible to be a will which is good to all, and the ground of all that is right, true, just, and gracious; the Bible also sets forth the Son of God as being one in will, purpose, and substance with the Father, and that his whole life on earth was an exhibition of, and submission to, his Father’s will; that the Son of God was Lord of men, the Root and Head of humanity, and the source of all light and righteousness in man: that being thus one with God and one with man, he brought the will of God into our nature, fulfilled it in our nature perfectly, and carried it down into the lowest condition into which it had fallen through sin; that in the fulfilment of this will in our nature, as its head, he shared its sufferings, enduring that wrath, or punishment which proceeded from Holy Love, thus making real in his own consciousness, on the one hand the sins of the world, and on the other the consuming fury of the holiness of the love of God—with an anguish which only a perfectly pure and holy Being, who is a perfectly sympathizing and gracious Being, can feel: that the man Christ Jesus was for this reason the object of his Father’s continual complacency—a complacency fully drawn out by the death of the cross—which so perfectly brought out to view the uttermost power of self-sacrifice which lay hidden in the divine love; and consequently that Christ exhibited humanity, in its head, atoned for, reconciled. In this way, to Mr. Maurice, is Christ ‘the Lamb of God, who taketh away the sin of the world.’

Finally, Dr. Trench, who may be regarded as fairly representing the prevalent views of the more devout and thoughtful men of the present day holding ‘orthodox’ opinions, speak as follows: ‘The spirit of man cries out for something deeper than repentance, confession of sin, amendment of life; something which shall reach further back; which shall not be clogged with sinful infirmities, as his own repentance even at the very best must be.

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Men cry for some work to rest upon, which shall not be *their* work, but which shall be God's; perfect, complete. They feel that there must be something which God has wrought, not only *in* them, but also and first of all *for* them; they yearn for this, for A., propitiation, ransom, and conscience purged from dead works by the blood of sprinkling; a rock to flee to which is higher than they, than their repentance, than their faith, than their obedience, even than their new life in the spirit. Now, this rock is Christ; and John the Baptist pointed to this rock, when, to those about him who longed after more than amendment of life, he exclaimed, in the memorable words: "Behold the Lamb of God which taketh away the sin of the world."

Christ's sacrifice was vicarious—he died not merely for the good of, but in the room and in the stead of, others; tasted death *for* them. He did this of his own free will. He saw that nothing else would overcome their sinful perversity and wilful obduracy, and that this would be effectual to do so.

Christ took upon himself the penalties of a sinful world, and his self-sacrifice is only *not* righteous, because it is so much better than righteous, because it moves in that higher region where law is no more known, but known no more only because it is transfigured into love. Vicarious suffering is the law and condition of all highest nobleness in the world. It is this which God is continually demanding of his elect, they approving themselves his elect as they freely own themselves the debtors of love to the last penny of the requirements which it makes.

But the sufferings and death of Christ were not merely vicarious, they were also satisfactory; and thus atoning or setting *at one*, bringing together the holy and the unholy, who could not have been reconciled in any other way. It is not maintained that God could have pleasure in the sufferings of the innocent and the holy, and that innocent and holy his own Son; but only that he must have the highest pleasure in the love, the patience, the obedience which those sufferings gave him the opportunity of displaying, which but for those he never could have displayed. Christ's sublime devotion to the will of God permitted the Father to say, 'I have found a ransom.' Christ satisfied herein, not the divine anger, but the divine craving and yearning after a perfect holiness, righteousness, and obedience in man, which craving no man had satisfied, but all had disappointed before.

Dr. Horace Bushnell has written on the A. with wonderful spiritual insight and with rich suggestiveness. His views on the A. have entered deeply as a modifying force into the recent thought of the church at large. His theory, however, is not so formulated as to yield itself easily to a logical classification, except that it has a leading place among 'moral influence theories.'

See the following works, consulted and used in the preparation of this article: Baur's *Christliche Lehre von der Versöhnung*; Hase's *Hutterus Redivivus*; Neander's *Christ*

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liche Dogmengeschichte; Giseler's *Lehrbuch der Dogmengeschichte*; Hagenbach's *Lehrbuch der Dogmengeschichte*, vierte Auflage; Calvin's *Institutes of the Christian Religion*; Edwards, *Concerning the Necessity and Reasonableness of the Christian Doctrine of Satisfaction for Sin*; Owen's *Death of Christ*, and *Of the Death of Christ*; Payne's *Lectures on Divine Sovereignty*; Chalmers's *Institutes of Theology*; Wardlaw's *Systematic Theology*; Campbell's (John M'Leod) *Nature of the Atonement*, etc.; Tayler's (J. J.) *Christian Aspects of Faith and Duty* (Discourse on 'Christ the Mediator'); Maurice's *Theological Essays*; Jowett's *St. Paul's Epistles*, first and second editions (Article 'On Atonement and Satisfaction'); Trench's *Five Sermons* (sermon on 'Christ the Lamb of God.') See also Bushnell's *The Vicarious Sacrifice*; Shedd's *History of Christian Doctrine*.

ATONIC, a. *ă-tŏn'ik* [Gr. *a*, not; *tonos*, tone]: wanting tone; debilitated. ATONY, n. *ăt'ŏ-nĭ*, loss of vital energy.

ATOP, ad. *ă-tŏp'* [AS. *a*, on, and *top*]: at or on the top.

ATRABILIARY, a. *ăt'ră-bil'ĭ-ēr-ĭ*, or ATRABILIAR, a. *ăt'ră-bil'ĭ-ēr*, or ATRABILA'RIAN, a. *-ă'rĭ-ăn*, [F. *atrabilaire*—from mid. L. *atrabilarĭus*, abounding in black bile—from L. *ater*, black; *bilis*, bile]: causing black bile; melancholic; hypochondriac. ATRABILIOUS, a. *ăt'ră-bil'ĭ-ŭs*, having abundance of black bile, as the supposed cause of melancholia; melancholic; hypochondriac.

ATRACTENCHYMA, n. *ăt'răk tĕng'kĭm-ă* [Gr. *atraktos*, a spindle, a distaff; *chumos*, juice, sap]: in *bot.*, tissue composed of spindle-shaped cells.

ATRAMENTACEOUS, a. *ăt-ra-mĕn-tă'shŭs*, or ATRAMEN'TAL, or ATRAMEN'TOUS, *-tŭs* [L. *atramentum*, anything black; ink—from *ater*, dull-black; Eng. *aceous*]: pertaining or relating to ink; inky; black as ink. ATRAMENTA'RIOUS, a. *-tă rĭ-ŭs*, suitable to be employed in the manufacture of ink. Applied especially to copperas, one of its ingredients.

ATRATO, *ă-tră'tŏ*: river of Colombia, important not by its size, but by its position in connection with the scheme of communication by water between the Atlantic and the Pacific. Such use of the A. was long ago predicted by Humboldt.

The main stream falls into the Gulf of Darien by nine mouths—the quantity of water, from the almost daily rains, being large in proportion to the area drained, which does not, at the utmost, exceed 300 m. by 75. Of the nine mouths, the third in rank, the Boca Coquito, appears to offer the most available facilities for improving the navigation. About 220 m. above this entrance, opposite to Quibdo, the A. is 850 ft. wide and 8 ft. deep at the shallowest parts, while the entire fall to the sea averages less than three inches to a mile. Unfortunately, however, the A. itself cannot advantageously be followed thus far, because, as one advances to the south, the intervening ridge to the west, and its streams toward the Pacific become less and less practicable.

ATRI—ATROCIOUS.

A comparatively convenient route was surveyed through the munificence of Mr. F. M. Kelley, a private citizen of New York. Aseending the Boea Coquito as before, this route leaves the main stream at a distance of 63 m. from the sea, following the Truando, one of its western affluents, for 36 m. more without impediment or interruption. From this point on the Truando to the Pacific there remain 32 m. The heaviest work would be a tunnel of $3\frac{1}{4}$ m. in length. According to the plan the canal would be without a lock. The plan (commended as the result of examination by the U. S. govt., 1871), utilizing the middle branch of the A. and the Jurador, flowing into the Pacific, would require 48 m. of canal. At the International Congress, Paris, 1879, for deciding the best route for the interoceanic canal, the A. route was, with various others, discussed and rejected in favor of one from Limon to Panama.

ATRI, *â'trê* (*Hadria Picena*): town of Italy, 14 m. s.e. of Teramo; on a steep hill, 6 m. from the Adriatic. Numerous remains of public buildings, baths, and walls attest its ancient importance. Pop. 4,000.

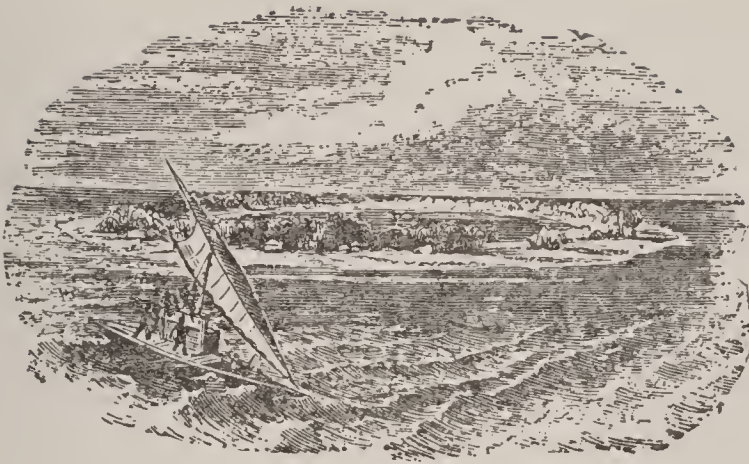
ATRIP, ad. *ă-trîp'* [*a*, and *trip*]: said of an anchor when just raised off of the ground in a perpendicular direction. A topsail is A. when it is just started from the cap.

AT'RIPLEX: see CHIENOPODIACEÆ: ORACHE.

ATRIUM, n. *ăt' rî-ŭm* [L. *atrium*, a front hall]: in *zool.*, the cavity or cloaca into which the intestine opens in the *Tunicata*: in *anat.*, that portion of the auricle of the heart into which the venous blood is emptied. ATRIAL, a. *ăt' rî-ăl*, designating a water-vascular system, furnished with contractile dilatations supposed to be a rudimentary respiratory apparatus, but probably only a secretory organ.

AT'RIUM, in Rom. Arch.: the covered court or entrance-hall which was the chief part of a Roman house. It was lighted from the roof, which sloped toward an opening in the centre (the *compluvium*), through which the rain-water flowed into a kind of eistern situated on the floor (the *impluvium*). On both sides, passages led to the several chambers. Its size was in proportion to the other parts of the house. After the burning of Rome in the reign of Nero, great attention was paid to the decorations of the entrance-halls or *atria*. Here the female slaves were engaged in weaving and other domestic occupations, under the superintendence of their mistress. Family pictures were preserved in the A.; it also contained the nuptial couch, and it served as a general waiting-room for visitors and elients. The *atria* of the temples were used as places of assembly.

ATROCIOUS, a. *ă-trō'shŭs* [F. *atroce*—from L. *atrōcem*, horrid, terrible]: very wicked; extremely cruel; criminal in the highest degree. ATRO'CIOUSLY, ad. -lŭ. ATRO'CIOUSNESS, n. the quality of being atrocious. ATROCITY, n. *ă-trōs ĭ-tŭ* [F. *atrocité*, great cruelty—from L. *atrocitātem*]: enormous wickedness; cruelty in the highest degree.—SYN. of 'atrocious': heinous; flagitious; flagrant; enormous; grievous.



Atoll.



▲trium of the House of Pansa in Pompeii (restored).



Atropal Ovule.



▲, Attic of Somerset House, London.

ATROPA—ATROWLI.

AT'ROPA: see BELLADONNA.

ATROPHY, n. *ăt'rō-fī*, or ATROPHIA, n. *ă-trō'fī-ă* [Gr. *atrophĭă*, want of food or nourishment—from *a*, without; *trophē*, nourishment]: a wasting away without manifest cause; a consumption; a morbid condition of animal or vegetable life, resulting in deficient nutrition of the body, or part of the body, and consequent decay and waste of its substance. The term is applied, not to the mere withholding the requisite supply of nutriment, but to the condition produced by various diseases that affect the body. See NUTRITION: also DIGESTION: DYSPEPSIA: HYPERTROPHY. ATROPIC, a. *ă-trōp'ik*, wasted; defectively nourished; in *bot.*, exhibiting an abortion and degeneration of organs. ATROPHIED, a. *ăt'ro-fīd*, unfed; not supported by their proper nourishment; hence, wasting, or wasted away. (Used of muscles, nerves, etc.)

ATROPIA, n. *ă-trō'pī-ă*, or ATROPIN, n. *ăt'rō-pīn*, or ATROPINA, n. *ă-trō'pī-nă*, $C_{17}H_{23}NO_3$ [*Atrōpos*, in *anc. myth.*, one of the Fates, whose duty it was to cut short the thread of life]: a very poisonous alkaloid, existing in all parts of the deadly night-shade (*Atropa Belladonna*), and in the seeds of the thorn apple (*Datura Stramonium*); hence called also DATURA or DATURINE. The pharmacopœial directions for extracting it from the roots of belladonna by means of alcohol are somewhat complicated. It is first taken up in combination with malic acid, which is removed by the addition of lime; sulphuric acid is then added, which throws down the lime and forms sulphate of atropia; the atropia is liberated by potassium carbonate, which also separates and resolves impurity, and is taken up by chloroform, which, after being distilled off, leaves A., which must be finally purified by decolorization with charcoal, and crystallization from an alcoholic solution. The crystals occur in colorless silky needles, united in tufts. A. is a highly poisonous irritant narcotic; a mydriatic antispasmodic and anodyne; in small doses a cardiac, respiratory, and spinal stimulant; in large doses, a paralyzer of the secretory and motor nerve-endings. It is extensively used in treatment of diseases of the eye, to dilate the pupil, and to paralyze the accommodative act. The effect of A. on the pupil is most marked, and the quantity required is infinitesimal, variously stated from $\frac{1}{10000}$ gr. (Wood) to $\frac{1}{70000}$ gr. (Donders). ATROPISM, n. *ăt'rō-pīzm*, the symptoms produced by the frequent medicinal use of belladonna.

ATROPOUS, a. *ăt'rō-pūs*, or ATROPAL, a. *ăt'rō-păl* [Gr. *a*, without; *tropē*, a turning]: in *bot.*, the ovule with foramen opposite to the hilum; an ovule having its original, erect position.—SYN.: orthotropous, and orthotropal.

ATROWLI, *ă-trow'lē*: town of British India; chief place of a pergunnah of the same name; in the dist. of Allygurh, N.W. Provinces; 63 m. n.n.e. from Agra. The streets are wide, the bazaar good, and the supply of water abundant. Pop. (1871) 15,052; (1891) 15,408.

ATRYPA—ATTACHMENT.

ATRYPA: genus of fossil brachiopod or lamp shells, having close resemblance to the well-known *Terebratula*. It possessed a perforation for the passage of the peduncle, by which the animal attached itself to foreign bodies. This foramen is not visible in all examples of the same species, from the beak touching and overlying the umbo of the other valve; the animal was, therefore, probably free during a portion of its existence. The name (derived from *a*, without, and *trypa*, foramen) was given to this genus by Dalman, as he erroneously supposed that the perforation was entirely absent. Judging from the markings on the interior of the shell, the animal seems to have differed little from the recent *Rhynchonella*, except that it had large calcareous spines for the support of its labial appendages. *A.* is a strictly palæozoic brachiopod, the solitary Permian species being the last representative of the genus. Of the 179 described species, 100 are Silurian, 56 Devonian, 22 Carboniferous, and 1 Permian.

ATTACCA, n. *ăt-tăk'ka* [Ital. *attaceo*, a sticking, a cleaving to—from *attacare*, to hang, to fasten]: in *mus.*, a direction given at the end of a movement to proceed to the next one without any intermediate pause. (Often with the word *subito*.)

ATTACH, v. *ăt-tăch'* [F. *attacher*, to tie, to bind, to fasten: *at* for *ad*. or F. *a*, to; Breton *tach*, a nail; *tacha*, to fasten with a nail: Ir. *taca*, a peg: It. *attaccare*, to attach]: to fasten or hang; to take by legal authority; to arrest; to fix; to win or gain over. **ATTACHING**, imp. **ATTACHED**, pp. *ăt-tăcht'*. **ATTACHABLE**, a. *-ă-bl*. **ATTACHMENT**, n. seizing of goods by legal authority; warm affection; fidelity; strong regard to. **ATTACHÉ**, n. *ăt-tă-shă* [F.]: one (generally a young diplomatist) attached to an ambassador as one of his suite or attendants.—**SYN.** of 'attach': to fix; affix; connect; combine; unite; tie; tack; fasten; subjoin; annex; charm; enamour; win;—of 'attachment': affection; inclination; adherence; fidelity; attendance; regard; adjunct.

ATTACHMENT, in Law: a writ applying both to persons and to property. *A. of Person* is a process issued by a court of record, directing the sheriff to produce before it the person within named, guilty of contempt of court, either by neglect or abuse of its process or of subordinate powers, or disregard of its injunction, and it is in some degree in the nature of a criminal process.

A. of Property is generally in the instance of debt, being issued to the creditor as against the property of the debtor. Its issuance is from a court of law, courts of equity having no power in the premises: in some states, however, it is authorized in chancery. In New England a writ of *A.* is always incident to a summons in actions upon contract, but in the other states it is issued only upon affidavit showing cause, verifying the plaintiff's base of action, and exhibiting grounds of *A.* in accordance with the local statute authorizing the writ. In general, the remedy by *A.* is allowed only to a creditor; in some states, however, there are special

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statutory provisions by which damages arising *ex delicto* may be sued for by A. Corporations may be proceeded against by A.; but heirs, executors, administrators, trustees, and others acting only as representatives, are not liable, as such, in this manner.

The levy of an A. does not change the estate of the defendant in the property attached; nor does the attaching plaintiff acquire any property thereby; nor can he acquire through his A. rights to the property attached, not inhering in the defendant at the time of A.: unless he be able to show the existence of fraud or collusion impairing his rights. The levy constitutes a lien on the property or credits attached, but this lien is of no value unless the plaintiff obtain judgment against the defendant, and proceed to subject the property to execution. Where two or more attachments are levied simultaneously against the same property, they are entitled severally to an aliquot part of the proceeds of the property. Where several attachments are levied successively on the same property, a junior attaching creditor may impeach a senior A., or judgment thereon, for fraud. During the pendency of a suit, an officer may deliver over attached property in his hands to some responsible person, styled a receiptor or bailee, who must receipt for it while awaiting the action of the court. In some states possession may be retained by the defendant by executing a bond with sureties for the delivery thereof, either to satisfy the execution, or when and where the court may direct. An A. may be dissolved by a final judgment for the defendant, or, on motion, on account of defects in the plaintiff's proceedings, apparent on their face.

Garnishment is an effectual A. of the defendant's effects in the garnishee's hands, but no judgment can be rendered against the garnishee until judgment against the defendant shall have been recovered. A debt not due may be attached in the hands of the garnishee, but he cannot be required to pay the same until it becomes due.

ATTACHMENT, FOREIGN: see FOREIGN ATTACHMENT.

ATTACK, *v.* *ăt-tăk'* [F. *attaquer*; Sp. *atacar*, to attack (see ATTACH)]: to fall upon with force or violence; to assault; to assail in words; to begin to dissolve as a chemical agent: N. a falling upon with violence; satire; unfriendly criticism. ATTACK'ING, *imp.* ATTACKED, *pp.* *ăt-tăkt'*.—ATTACK'ABLE, *a.* *-a-bl*, able to be attacked. ATTACK'ER, *n.* *-ér*, one who attacks.—SYN. of 'attack, *v.*': to assail; assault; encounter; invade;—of 'attack, *n.*': onset; charge.

ATTACK', in Warfare: an advance upon the enemy, with a view of driving him from his position, whether in the open field or within fortifications.

In an attack in the open field, the general first ascertains the strength and position of the enemy, by means of a reconnaissance or of spies. He then seeks to discover at what point the enemy can make the least resistance, generally on one or other flank. He next arranges to concentrate his chief strength upon this particular point; and to mask his

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real intention by feigned operations in other places. He then attacks with energy and force; his troops advancing without halt till near enough to use their weapons with the greatest effect. The more the attack has the character of a 'surprise,' the greater the probability of its success. In order to make this success as much felt as possible, and to be provided also against unforeseen disaster, the attacking body should be followed at a distance by a reserve; a neglect of this precaution has frequently caused the entire failure of an attack. Various forms have been devised for the attack; but the usual form is the *parallel* or *frontal*. Frederick the Great, however, won most of his battles by the oblique attack, in which one wing is more advanced than the other. The first Napoleon preferred, by means of his heavy columns, to penetrate and break up the enemy's centre. Another mode combines an attack on one flank as well as in front, by two separate corps; so as either to get into the enemy's rear, or to perplex him as to his retreat. A skilful general will be guided by circumstances in his selection among these modes. An attack by night might act most signally as a surprise; but as this requires a very exact knowledge of the ground, an attack at early dawn is generally preferred.

The different arms of the service render each its own kind of aid during an attack. First come the skirmishers, or perhaps whole battalions of light and active troops, whose rifles or long-range guns commence the firing. Then come the main body of infantry in heavy column; they halt within musket-shot, fire, and charge with the bayonet—the skirmishers meanwhile deploying round to the rear of the column, but holding themselves in readiness to harass the enemy's flanks. English troops especially excel in the attack by bayonet in line; many other armies rely more on the momentum of a compact and heavy column in an attack. There are positions in which the cavalry attack, with its shock and the use of the sword, is more efficacious than that of the infantry. The troopers approach at a trot, break into a gallop at a distance of one or two hundred paces from the enemy, and endeavor by their weight and impetuosity to force the enemy's line. There are many forms of cavalry attack, according to the nature of the ground and the position of the enemy. The artillery, working at a distance, often begin an A. long before the infantry and cavalry can come up, harassing and confusing the enemy. At 800 to 1200 yds. distance, the artillery pour out shot and shell, and try to silence the enemy's guns, so as to make way for the A. of the infantry; while the bayonet-charge is being made, the artillery keep in check the enemy's cavalry. If the A. succeeds, the infantry and artillery take up the ground recently occupied by the enemy, leaving the cavalry and riflemen to maintain a pursuit; but if it fail, the artillery and cavalry take up such positions as will cover the retreat of the infantry.

In an A. upon a fortress, the operation is a part of that of besieging (see SIEGE); but very often intrenchments are attacked in the open field. Such an A. has the character

ATTACUS—ATTAINDER.

of a surprise, when the works are approached under cover of night, and an attempt is made to break into them on all sides. In such case there is a reserve corps, which is rapidly brought up when wanted; but the attacking corps retire behind the reserve if repulsed. The artillery post themselves on the prolongation of the line of works, and try to dislodge the enemy's guns and gunners; or pour a concentric fire sufficient to breach the works. The infantry advance as close as will enable them to fire upon the gunners. When the enemy's fire is silenced, the engineers (under cover of the artillery) proceed to remove palisades and all other obstacles, and to bridge over ditches and openings. Then follow the operations of the storming-party. See ASSAULT.

ATTACUS, n. *ăt'tăk-ŭs* [L. *attacus*—from Gr. *attakos* and *attakes*, a kind of locust]: genus of moths belonging to the family *Bombycidae*. *A. Cynthia* is the Ailanthus Silkworm, so called because its caterpillar feeds upon the Ailanthus-tree, *Ailanthus glandulosus*.

ATTAGAS, n. *ăt'ta-găs*, or ATTAGEN, n. *ăt'ta-jěn* [Gr. *attagas*, a long-billed bird, fond of the water, and esteemed a great delicacy. The Godwit (?). Also L. *attagen*, a hazel-hen, or heath-cock, found in Spain, the south of France, etc.]: the *attagas* of Buffon, the *attagen* of Aldrovandi, is believed by Cuvier to be the young or the female of *Tetras bonasia*, and the *attagen* or *ganga* to be the pintailed grouse. The latter of these is found all round the coasts of the Mediterranean.

ATTAIN, v. *ăt-tăn'* [F. *atteindre*, to touch, to attain—from L. *attingĕrĕ*, to touch against—from L. *ad*, *tango*, I touch]: to come to or reach by exertion; to arrive at; to gain; to achieve. ATTAIN'ING, imp. ATTAINED, pp. *ăt-tānd'*. ATTAINABLE, a. *ăt-tăn'ă-bl*, that may be attained by efforts of the body or mind. ATTAIN'ABILITY, n. *-bĭl'ĭ-tĭ*, or ATTAIN'ABLENESS, n. *-bl-nĕs*, the quality of being attainable. ATTAIN'MENT, n. the act of arriving at or reaching by effort; proficiency in any branch of knowledge.—SYN. of 'attain': to acquire; obtain; gain; win; earn; procure.

ATTAINDER: the legal consequence of judgment of death or outlawry, in respect of treason or felony; formerly involving *forfeiture of estate*, real and personal, and *corruption of blood*, and generally, in present usage, involving extinction of civil rights and capacities. Thus, an attainted person cannot sue in a court of justice; he loses all power over his property; and he is by his A. rendered incapable of performing any of the duties or entering into any of the privileges of a free citizen. But absolute and severe as formerly were the consequences of A., neither the government nor the crown could exercise absolute or capricious authority regarding an attainted person; everything was to be according to principle and rule, and for the ends of public justice. Formerly an attainted person

ATTAINT—ATTALEA.

could not give evidence in a court of justice; but that disability has been removed.

Since the revision of the law, 1870, the forfeiture of estate and corruption of blood by A. are no longer legal in Britain. For A. by express legislative enactment in parliament, see BILL OF ATTAINDER. In the United States A. has never had legal existence, being utterly forbidden by the federal constitution (art. i. sec. 9), 'No bill of attainder or ex-post facto law shall be passed.'

ATTAINT, v. *ăt-tânt'* [OF. *attaindre*, to accuse, to stain; *attaint*, accused, stained—from L. *attingĕrĕ*, to touch against—from L. *ad*, to; *tingo*, I stain, or *tango*, I touch]: to reach or attain to; to corrupt; to taint; to disgrace; to find guilty of treason or felony; to render infamous: N. a stain; reproach; hurt. ATTAINT'ING, imp. ATTAINT'ED, pp. ATTAINTURE, n. *ăt-tân'tūr*, state of being attainted. ATTAINDER, n. *ăt-tân'dēr*, that which renders impure; in Britain, the act of parliament decreeing the loss of civil rights and estate for the crime of treason or other capital offense, is called an *Act of Attainder*; the judicial process is called a *Bill of Attainder*. (Note.—There can be but little doubt that *tango*, I touch, and not *tingo*, I stain, is the primary root-word. The confusion has arisen from the fact that the reputation of a person is *reached* or *touched* by the sentence of a court of justice, and so his character is disgraced and stained, and becomes attainted; etymologically, to *attaint* is 'to convict,' and *attainder* is 'the conviction'—see Skeat and Wedgwood.)

ATTAINT', WRIT OF: anciently in England a mode of inquiring whether a jury had given a false verdict; now abolished.

ATTAKAPAS, *ăt-tŭk'a-pă*: a large and fertile district in the s.w. of Louisiana, which includes the parishes of Iberia, Lafayette, St. Martha, St. Mary, and Vermillion. It is chiefly remarkable for its large production of sugar and molasses.

ATTALEA, *ăt-tŭ-lĕ'a*: genus of palms, comprising a number of species, natives of the tropical parts of S. America. They have in general lofty, cylindrical, smooth stems, but there are some stemless species. The leaves are large and pinnate. The fruit has a dry, fibrous husk, inclosing a nut with three cells and three seeds. The leaves of some species are much used for thatching, and those of some are woven into hats, mats, etc. The nuts of *A. excelsa* and of *A. speciosa* are burned to dry the India-rubber obtained from the *Siphonia elastica*, which acquires its black color from their smoke. The leaf-stalks of *A. funifera*, found in the s. maritime provinces of Brazil, and there called Piassaba, yield a fibre much used for cordage. The ropes made of it are very strong, and extremely durable in salt water. The Piassaba palm of the n parts of Brazil, however, is totally different, and much of the Piassaba (q.v.) fibre exported to other countries is obtained from it. The fruit of *A. funifera*, known by the name of Coquilla nut (q.v.) is as large as an ostrich's egg, and supplies a kind

ATTAR—ATTEND.

of vegetable ivory, used for making umbrella handles, etc. The fruit of *A. compta*, the Pindóva or Indajá palm, is of the size of a goose's egg, and the kernels are eatable. It is a stately and beautiful tree, with a wide-spreading crown.

ATTAR, n. *ăt'târ*, or OTTO OF ROSES, *ôt'tō* [Hind. *atr*, essence: Arab. *itr*, perfume]: a precious oil made in eastern countries, generally from roses; a valuable perfume. See OTTO.

ATTELABUS, n. *ăt-těl'a-bŭs* [L. *attelabus*—from Gr. *attelabos*, a small, wingless species of locust]: genus of Coleoptera (Beetles), belonging to the family *Curculionidæ*, or *Weevils*; originally introduced by Linnæus with the character, 'Head attenuated, behind inclined. Antennæ somewhat thick towards the apex.' In the 13th edition of his *Systema Naturæ* (1767), as many as thirteen species are enumerated. Most of these, however, are now transferred to the genus Coleoptera.

ATTEMPER, v. *ăt-těm'pěr* [OF. *atemprrer*, to modify—from L. *ad*, to; *tempĕro*, I mix in due proportion]: to mix in proper proportions; to soften or moderate; to modify; to mingle. ATTEM'PERING, imp. ATTEM'PERED, pp. *pĕrd*. ATTEM'PERLY, ad. *-lŭ*, in *OE.*, in a temperate manner. ATTEM'PERMENT, n. the act of tempering, or the state of being tempered.

ATTEMPT, v. *ăt-těmt'* [F. *attenter*, to attempt: OF. *atempter*, to undertake; *tempter*, to try—from L. *ad*, to; *tento*, I try]: to try; to make an effort to accomplish; to endeavor: N. an attack; an endeavor to gain a point. ATTEMPT'ING, imp. ATTEMPT'ED, pp. ATTEMPT'ER, n. one who. ATTEMPT'ABLE, a. *-ă-bl*, that may be attempted or tried. ATTEMPTABILITY, n. *ăt-těmp-ta-bil'ĭ-tŭ*, capability of being attempted; a person or persons, or a thing or things capable of being attempted. ATTEMPTATE, n. *ăt-těm'tăt*, an attempt or endeavor, especially to commit a crime. In 1589, Puttenham ranked this word as one quite recently introduced into the language. It arose, however, somewhat earlier than he thought.—SYN. of 'attempt, n.': trial; exertion; endeavor; effort; attack; essay.

ATTEMPT, to commit a felony or criminal offense: in many instances equally cognizable by the criminal tribunals with the completed crime itself. See TREASON: FELONY: MISDEMEANOR.

ATTEND, v. *ăt-těnd'* [F. *attendre*: OF. *atendre*, to wait: It. *attendere*, to expect, to await—from L. *attendĕrĕ*, to attend—from L. *ad*, to; *tendo*, I stretch out]: to wait on; to accompany; to be present; to listen to; to fix the attention upon. ATTEND'ING, imp. ATTEND'ED, pp. ATTEND'-ANT, n. a follower; a servant: ADJ. accompanying; being present. ATTENDANCE, n. *ăt-tĕn'dăns*, act of serving or waiting on; duty; in *OE.*, attention; regard. ATTENTION, n. *ăt-tĕn'shŭn* [F.—L.]: the act of attending; paying heed to; steady application of the mind; act of courtesy. ATTENTIVE, a. *ăt-tĕn'tiv*, paying due regard to; mindful. ATTENT', a. [L. *attentus*, attentive]: contr. for *attentive*.

ATTENTATES—ATTERBURY.

ATTEN'TIVELY, ad. *-tív-lǐ*. **ATTEN'TIVENESS**, n. the quality of being attentive. To **DANCE ATTENDANCE**, to wait on and obey the caprices of another obsequiously.—**SYN.** of 'attend': to mind; regard; notice; heed; wait on; hearken; listen; accompany; escort;—of 'attention': application; study; care; heed; consideration; regard; respect; advertence;—of 'attentive': careful; mindful; observant; watchful; circumspect; intent.

ATTENTATES, n. pl. *ăt-tě'n'tāts* [Fr. *attentat*, an attempt—from L. *attentata*, nom. plu. of pp. of *attento*, to stretch out, to attempt]: proceedings in a court of judicature, pending suit, and after an inhibition is decreed; things done after an extra-judicial manner.

ATTENUATE, v. *ăt-tě'n'ũ-ăt* [L. *attenuātus*, made very thin—from *ad*, to; *tenũō*, I make thin—from *tenũis*, thin: F. *attenuer*]: to make very thin; to reduce in thickness or density. **ATTEN'UATING**, imp. **ATTEN'UATED**, pp. **ATTENUATION**, n. *ăt-tě'n'ũ-ă'shŭn* [F.—L.]: the act of making thin, fine, or slender. **ATTENUANT**, a. *ăt-tě'n'ũ-ănt*, making thin: N. a medicine which attenuates.

ATTERATE, v. *ăt'tér-ăt* [L. *attero*, to rub at, towards, or against—from *ad*, to; *tero*, to rub]: to rub away; to form or accumulate by rubbing away. **AT'TERATED**, pp. **AT'TERATING**, imp. **AT'TERA'TION**, n. *-ă'shŭn*, the process of wasting the land away by the action of the waves.

ATTERBURY, *ăt'er-bér-ĭ*, FRANCIS, Bp. of Rochester: 1662, March 6—1732, Feb. 15; b. Milton, near Newport Pagnel, Buckinghamshire; educated at Westminster School and Christ Church, Oxford. In 1693, he went to London, where his rhetorical powers soon won reputation. He became a royal chaplain, minister of Bridewell, and lecturer of St. Bride's. He was combative, turbulent, and ambitious; a caustic and reckless controversialist; and, as a zealous partisan of the ecclesiastical against the civil authority, he received promotion; becoming, 1704, Dean of Carlisle; 1707, Canon of Exeter. In 1710, he was chosen prolocutor to the lower house of convocation, and in the same year he had the chief hand, according to the common belief, in drawing up the famous defense of Dr. Sacheverell; in 1712, he became Dean of Christ Church; in 1713, he was made Bp. of Rochester and Dean of Westminster. The death of Queen Anne extinguished his hopes for the primacy, as his known character and Jacobite leanings made him no favorite with George I. His deep complicity in a succession of plots for the restoration of the Stuarts brought upon him at length the charge of treason, and, 1722, Aug., he was committed to the Tower. By a bill of pains and penalties, passed in the lords by 83 to 43, A., who had defended himself with great ability, was deprived of all his ecclesiastical offices, incapacitated from holding any civil or spiritual office in the king's dominions, and condemned to perpetual banishment. He settled in Paris, where he was active in Jacobite conspiracies till his death. His fame as a writer rests

ATTEST—ATTICA.

chiefly on his letters to Pope, Swift, etc.; as a letter-writer, indeed, he has seldom been surpassed.

ATTEST, v. *ăt-tĕst'* [F. *attester*, to attest—from L. *attestāri*, to bear witness to—from L. *ad*, to; *testor*, I bear witness—from *testis*, a witness]: to bear witness to; to certify; to affirm solemnly in words or writing. **ATTEST'ING**, imp. **ATTEST'ED**, pp. **ATTES'TOR** or **ATTES'TER**, n. one who. **ATTESTATION**, n. *ăt'tĕs-tā'shŭn* [F.—L.]: the act of bearing witness to; putting a name to a writing in order to show it to be authentic (see **DEEDS**: **WILLS**: **WITNESSES**: **TESTING CLAUSE**); in *mil.*, the act of signing a declaration and taking a verbal oath on the part of a recruit, that he will serve the sovereign faithfully for a specified number of years. **ATTES'TATIVE**, a. or **ATTES'TIVE**, a. *-tĭv*, attesting; containing an attestation.

ATTEYNANT, a. *ăt-tān'ănt* [L. *attinens*—from *attineo*]: attainable; appertaining.

ATTIC, a. *ăt'tĭk* [L. *Atticus*: Gr. *Attikos*, pertaining to Attica or Athens: It. *attico*: F. *attique*]: pertaining to Attica, a state in Greece; elegant; classical; applied by Athenian architects to an order or series of small square pillars placed upon the uppermost part of a building: N. an Athenian; a low story rising above the cornice that terminates the main elevation of a building; the flat or floor on the upper part of a house; a garret; in *arch.*, a plain or decorated parapet-wall on the upper part of the façade of a building. **ATTICISM**, n. *ăt'tĭ-sĭzm*, the purest style of the Greek language—Attic dialect being the dialect of Athens, in which most of the great works of Greek antiquity were written. **ATTICIZE**, v. *ăt'tĭ-sĭz*, to make use of atticism. **AT'TICIZ'ING**, imp. **ATTICIZED**, pp. *ăt'tĭ-sĭzd'*. **ATTIC MUSE**, n. *ăt'tĭk mŭz*, a fine poetic vein.

ATTICA, *ăt'tĭ-ka*: one of the political divisions or states of Ancient Greece or Hellas, of which Athens was the capital. The territory is triangular, having its n.e. and s.w. sides washed by the sea, while on the n. it is connected with the mainland. In ancient times, it was bounded on the w. by Megaris and the Gulf of Saronica; on the s., which ran out into the 'marble steep' of Sunium, by the Ægean Sea; on the e., by the Ægean Sea; and on the n., by Bœotia, from which it is separated by a lofty range of hills, the most famous part of which was formerly called Cithæron. Ancient A. was thus walled in from the rest of Greece. The two principal rivers were the Cephissus and Ilissus; and if they exhibited the same features in ancient times as now, must have been mere mountain-torrents, dry in summer. The unfruitfulness of the soil, and the scarcity of water, compelled the inhabitants occasionally to send out colonies. According to ancient tradition, the aborigines of A. were civilized first under Cecrops, who is said to have come hither from Sais, at the mouth of the Nile in Egypt, about B.C. 1550; and to have introduced the culture of olives, and of several species of grain, as also to have implanted milder manners, and taught the worship of the gods. He is stated to have divided the country

ATTICUS—ATTIGUOUSNESS.

into twelve communities or states. This, however, was not the only division known in early A. A still older division into *phylai*, or tribes, existed, also a minute subdivision into *demoi*, or townships. By Theseus, Athens was united with the eleven other states of A. under one government, of which Athens was made the seat. After this union of the several states, the whole of A. shared in the fortunes of Athens (q.v.), and, under Vespasian, became a Roman province. On the division of the Roman empire, A. naturally fell into the hands of the Greek emperors. In A.D. 396, it was captured by Alaric, King of the Goths. It is impossible to determine precisely what its population was in ancient times. Clinton estimates it at upwards of half a million, but this is probably too large.

In the present arrangement, Attica and Bœotia form a dept. or govt. in the kingdom of Greece. The surface of the country is broken into hills and narrow plains. The most considerable hills are—Parnes, 4,634 ft.; Cithæron, 4,624; Pentelicus, famous for its marble in ancient times, of a white brilliant appearance and perdurable character, 3,641; and Hymettus, 3,368. The largest plains extend in the neighborhoods of Athens and Eleusis. As early as the time of Solon, A. was well cultivated, and produced wine and corn. Mount Hymettus was celebrated for its bees and honey, and metals were found in the range of Laurium. Figs, olives, and grapes are still cultivated. Goats and sheep find suitable pasturage; but the country does not now produce much grain. Pop. of A. and B. (1879) 185,364; (1889) 257,764.

ATTICUS, *ăt'î-kŭs*, TITUS POMPONIUS: one of the most noble and generous men in ancient Rome: B.C. 109—B.C. 32: born a few years before the birth of Cicero. His excellent education with Torquatus, the younger Marius, and Cicero, was supplemented by a stay in Athens, where he remained many years, glad to be separated from the political distractions of his native land. After B.C. 65, when he was induced by Sulla to return to Rome, he still devoted himself chiefly to study and the pleasures of friendship, and refused to take part in political affairs, though exerting much influence on public matters. A. had inherited great wealth, which he had increased by judicious mercantile speculations. His mode of life was frugal. When he was informed that a disorder under which he was laboring was mortal, he voluntarily starved himself to death. Among his personal friends, Cicero held the first place. The *Annales*, written by A., containing genealogical histories of the old Roman families, were highly commended by his contemporaries. In A. fine culture and a fortunate social position had highly developed the faculty of good taste. He had no creative genius, but was possessed of such delicate discernment that he could detect the flaw that would have been invisible to Cicero. Every author was anxious to secure his favorable opinion. None of his writings have been preserved. His biography is found in Cornelius Nepos, and in Cicero's *Epistles to A.*

ATTIGUOUSNESS, n. *ăt-tĭg'ŭ-ŭs-nĕs* [Eng. *attiguous*—

ATTILA.

from L. *attiguus*—from *attigo*, old form of *attingo*, to touch]: the quality of being attiguous; contiguity.

ATTILA, *ät'il-a* [Ger. *Etzel*; Hungarian, *Ethele*, conjectured to have been originally titles of honor]: King of the Huns (d. 453); son of Mundzuk, a Hun of the royal blood. In 434, he succeeded his uncle Roas as chief of countless hordes scattered over the n. of Asia and Europe. His brother Bleda, or Blödel, who shared with him the supreme authority over all the Huns, was put to death by A. 444 or 445. The Huns regarded A. with superstitious reverence, and Christendom with superstitious dread, as the 'Scourge of God.' It was believed that he was armed with a supernatural sword, which belonged to the Scythian god of war, which must win dominion over the whole world. It is not known when the name 'Scourge of God' was first applied to A. He is said to have received it from a hermit in Gaul. The whole race of Huns was regarded in the same light. In an inscription at Aquileia, written a short time before the siege in 452, they are described as *imminentia peccatorum flagella* (the threatening scourges of sinners). The Vandals, Ostrogoths, Gepidæ, and many of the Franks, fought under his banner, and in a short time his dominion extended over the people of Germany and Scythia—i.e., from the frontiers of Gaul to those of China. In 447, after his unsuccessful campaign in Persia and Armenia, he advanced through Illyria, and devastated all the countries between the Black Sea and the Mediterranean. Those inhabitants who were not destroyed were compelled to follow in his train. The emperor Theodosius collected an army to oppose the inundation of the barbarians, but was defeated in three bloody engagements. Constantinople owed its safety solely to its fortification and the ignorance of the enemy in the art of besieging; but Thrace, Macedon, and Greece were overrun; seventy flourishing cities were desolated, and Theodosius was compelled to cede a portion of territory south of the Danube, and to pay tribute to the conqueror, after treacherously attempting to murder him. In 451, A. turned his course to the West, to invade Gaul, but was here boldly confronted by Aëtius, leader of the Romans, and Theodoric, King of the Visigoths, who compelled him to raise the siege of Orleans. He then retired to Champagne, and in the wide plain of the Marne—called anciently the Catalaunian Plain—waited to meet the enemy. The army of the West, under Aëtius and Theodoric, encountered the forces of the Huns near the site now occupied by the city of Chalons-sur-Marne. Both armies strove to obtain the hill of moderate height which rises near Mury, and commands the field of battle, and after a terrible contest the ranks of the Romans and their allies, the Visigoths, were broken. A. now regarded victory as certain, when the Gothic prince, Thorismund, immediately after his father had fallen, assumed the command, and led on the brave Goths, who were burning to avenge the death of Theodoric. Their charge from the height into the plain was irresistible. On every side the Huns were routed, and A. with difficulty

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escaped into his encampment. This, if old historians are to be trusted, must have been the most sanguinary battle ever fought in Europe; for it is stated by contemporaries of A. that not less than 252,000 or 300,000 slain were left on the field. A. having retired within his camp of wagons, collected all the wooden shields, saddles, and other baggage into a vast funeral pile, resolving to die in the flames rather than surrender; but by the advice of Aëtius, the Roman general, the Huns were allowed to retreat without much further loss, though they were pursued by the Franks as far as the Rhine. In the following year, A. had recovered his strength, and made another incursion into Italy, devastating Aquileia, Milan, Padua, and other cities, and driving the terrified inhabitants into the Alps, Apennines, and the lagoons of the Adriatic Sea, where they founded Venice. The Roman emperor was helpless, and Rome itself was saved from destruction only by the personal mediation of Pope Leo I., who visited the dreaded barbarian, and is said to have subdued his ferocity into awe by the apostolic majesty of his mien. This deliverance was regarded as a miracle by the affrighted Romans, and old chronicles relate that the apostles Peter and Paul visited the camp of A., and changed his purpose. By 453, however, A. appears to have forgotten the visit of the two beatified apostles, for he made preparations for another invasion of Italy, but died of hemorrhage on the night of his marriage with the beautiful Ildiko. His death spread consternation through the host of the Huns. His followers cut themselves with knives, shaved their heads, and prepared to celebrate the funeral rites of their king. It is said, that his body was placed in three coffins—the first, of gold; the second, of silver; and the third, of iron; that the caparison of his horses, with his arms and ornaments, was buried with him; and that all the captives who were employed to make his grave were put to death, so that none might betray the resting-place of the King of the Huns.

Jornandes describes A. as having the Mongolian characteristics—low stature, a large head, with small, brilliant, deep-seated eyes, and broad shoulders.

ATTIRE, v. *ăt-tîr'* [OF. *atour*, female head-dress; *atirer*, to adorn—from O. Ger., and O. Sax *tîr*, glory]: to adorn with garments; to dress; to array: N. clothes; apparel. **ATTIR'ING**, imp. **ATTIRED**, pp. *ăt-tîrd'*. **ATTIR'ER**, n. one who.

ATTITUDE, n. *ăt'tî-tūd* [F. *attitude*, posture—from It. *attitu'dinē*, disposition to act: Sp. *actitud*, attitude, position]: position of persons or things; posture; a position assumed or studied to serve a purpose. **ATTITUDINAL**, a. *ăt'tî-tū'dî-nāl*, pertaining to. **ATTITUDINIZE**, v. *ăt'tî-tū'dî-nîz*, to assume affected airs or postures. **AT'TITU'DINI'ZING**, imp. **AT'TITU'DINIZED**, pp. *-nîzd*. **ATTITUDINARIAN**, n. *ăt-tî-tū-dîn-ă'rî-ăn*, one who gives particular attention to attitudes.—**SYN.** of 'attitude': posture; action; gesture; gesticulation; appearance.

ATTLE—ATTORN.

ATTLE, n. *ăt'tl* [perhaps corrupted from *addle*, rotten, which see]: a term used in Cornwall for rubbish thrown out of a mine, containing little or no ore.

ATTLEBOROUGH, *ăt'tl-băr-rō*: post village in the tp. of A., Bristol co., Mass., 31 m. n.e. from Boston, on the Boston and Providence railroad. The township is situated on Ten Mile river. Chief manufactures are clocks, jewelry, and buttons; in the jewelry trade it shares with Providence the bulk of that business east of Newark and New York, containing more than fifty establishments, turning out gilt and gold jewelry, finger-rings, ear-rings, bracelets, lockets, chains, charms, breastpins, etc. Most of these goods are plated, or gilded, and are sold by travelling agents. There are several cotton-mills, running about fifty thousand spindles, also various other manufactories. A. was settled 1669, and its garrison was one of those holding the line of fortifications against the Indians, from Boston to Newport. The town formerly included Cumberland, R. I.; it was called 'North Purchase,' and was incorporated 1694, Oct. 19. A branch railroad connects A. with North A., also with Trenton on the e. Pop. (1890) 7,577; (1900) 11,335.

ATTOCK, *ăt-tōk'*: town and fort of the Punjab, on the left or e. bank of the Indus. The town stands below the fort, a parallelogram of 800 yds. by 400, established by the emperor Akbar, 1581, to defend the passage of the river, but it is no longer a position of strength. The great railway bridge across the Indus here was opened 1883. It has 5 arches 130 ft. high, and renders continuous the railway connection between Calcutta and Peshawur (1600 m.). Pop. 4,210.

The situation of A. is important, whether in a commercial or in a military view. It is at the head of the steam-boat navigation of the Indus, being 940 m. from its mouth; while about 2 m. above it, the Cabul river, the only considerable affluent of the Indus from the w., is practicable for vessels of 40 or 50 tons to a distance of 50 m. The valley of this last-mentioned stream, presenting the best approach to the e. and s. from central Asia, has been the route of nearly all but the maritime invaders of India from the days of Alexander the Great downwards. *Taxila*, where the Macedonians crossed the Indus, is supposed to have been the same as Attock.

ATTOLLENT, a. *ăt-tōl'lěnt* [L. *ad*, to; *tollen'tem*, lifting or raising]: in *OE.*, raising or lifting up.

ATTORN, v. *ăt-tŭrn'* [OF. *attorner*, to direct, to dispose—from *torner*, *tourner*, to turn: Ital. *attorniare*, to encompass, to enclose; *attorner*, about: L. L. *attornare*, *attorniare*, *atturnare*, to commit business to another, to attorn—from clas. L. *ad*, to; *torno*, to turn in a lathe, to round off—from Gr. *tornus*, a carpenter's tool like our compasses]: to transfer the feudal allegiance of a vassal, or the vassals generally, to a new lord on his obtaining an estate from its former possessor; to profess to become tenant of a new lord. **ATTORNING**, imp.

ATTORNEY.

ATTORNEY, n. *ăt-tēr'nĭ*, ATTOR'NEYS, n. plu. [Norm. F. *attourné*: mid. L. *attornātus*, put in the place of any one—from L. *tornārĕ*, to turn, to fashion: OF. *atorné*, directed, arranged for business]: one put in the turn or place of another; one who acts for another, as in a court of law; a lawyer. ATTOR'NEYSHIP, n. the office of an attorney. ATTOR'NEY-GENERAL, in Eng., the head law officer of the crown: in the United States, an official in each state, and in the cabinet at Washington, having charge of the legal business of the governments which they respectively serve; they appear, or serve, in all suits in which their government is a party, and advise in all its legal proceedings and interests. POWER or LETTER OF ATTORNEY, written authority given to one person empowering him to act for, or to transact certain business for another.

ATTORNEYS or COUNSELLORS-AT-LAW, AND SOLICITORS: legal practitioners who conduct litigation in courts of justice; (in England) preparing the cause for the barristers, whose duty and privilege it is to plead and argue in open court on behalf of the contending parties; in the United States usually both preparing the case in private, and presenting it in court. A. and S. also practice conveying, or the preparation of legal deeds and instruments, and they manage much other general business connected with the practice of the law, for which, as well as for the discharge of all their duties, they are mostly remunerated by a fixed and minute scale of charges.

They are called A., as practitioners in the courts of common law, because the attorney is one who is put in the place, stead, or *turn* of another. In former times when prosecuting or defending, suitors were obliged to appear *personally* in court; but now A. may represent, and can often prosecute or defend any action or suit in the absence of, the parties. They are called *Solicitors* in the courts of chancery and equity; and the same name is sometimes given to this profession when transacting family or other general business out of court, and in their own chambers. Solicitor is the term sometimes applied also to the law-officer of a city, etc. A., being admitted by the courts, of which therefore they are officers, have many privileges as such; and they are in consequence peculiarly subject to the control and censure of the judges.

In the United States, A. and S. are officers in a court of justice employed by parties in suits to manage the same before the court. These may either be selected by the parties to the action, or, in case of default in this, may be designated by the court. The eligibility of legal practitioners to hold such positions is decided by local legislation or by the rules of the court. Thus women can act as attorneys-at-law only in the several states when permitted by special statute, but any woman of good standing at the bar of the supreme court of any state or territory or of the Dist. of Columbia for three years, and of good moral character, may become a member of the bar of the supreme court of the U. S.

In the absence of fraud, the client is concluded by the

ATTOUR—ATTRACTION.

acts, and even by the omissions, of his attorney; the duties of the attorney being—to be true to the court and to his client; to manage the business of his client with care, skill, and integrity; to keep his client informed as to the state of his business; to keep his secrets confided to him as such; and he is privileged from disclosing such secrets when called as a witness. For a violation of these duties, an action will, in general, lie, and, in some cases, he may be punished by attachment. Official misconduct may be inquired into in a summary manner, and the name of the offender, on conviction, be stricken from the roll.

ATTOUR, prep. and ad. *ăt-tôr'* [Fr. *autour*, round about; or Eng. *out, over*, pronounced rapidly and indistinctly]: as prep., over; across; beyond; above; further onward than; exceeding in number; past; as adv., moreover.

ATTRACT, v. *ăt-trăkt'* [OF. *attraicter*, to attract—from mid. L. *attractāre*, to draw forth—from L. *ad*, to; *tractus*, drawn]: to draw to by some kind of influence; to allure. ATTRACT'ING, imp. ATTRACTED, pp. *ăt-trăk'těd*. ATTRAC'TOR, n. one who. ATTRACTABLE, a. *ăt trăk'tă-bl*, that may be attracted. ATTRACT'ABILITY, n. *bîl'î-tî*, power of attraction. ATTRACTIVE, a. *ăt-trăk'tîl*, that can attract. ATTRACTION, n. *ăt-trăk'shŭn*, the act of drawing to; that which draws; the power that bodies have of coming together and uniting—*attractions* take place between bodies—*affinities* between the particles of a body. ATTRACTIVE, a. *ăt-trăk'tîv*, drawing to; alluring. ATTRAC'TIVELY, ad. *-tîv lî*. ATTRAC'TIVENESS, n. the quality of being attractive or engaging. ATTRACT'INGLY, ad. *-lî*. ATTRACTION OF GRAVITATION, that power which acts at all distances throughout the universe. CAPILLARY ATTRACTION, that power which causes liquids to rise in small tubes or porous substances. CHEMICAL ATTRACTION or AFFINITY, the power by which the ultimate particles of bodies of unlike kinds unite themselves together to form a new body possessing new and specific properties. COHESIVE ATTRACTION or ATTRAC'TION OF COHESION, that power which causes the particles of a body to unite or cohere to form a recognized body, whether aeriform, fluid, or solid.—SYN. of 'attract': to allure; invite; entice; draw; charm; engage.

ATTRACTION: general name for the force or forces by which all bodies, from the minutest particles to the largest planets, suns, and systems of suns, tend to approach, or are *drawn towards* one another, and when in contact, are held together. The term is generic, embracing a vast variety of facts, which are subdivided under five heads or species of A. These are—1. Gravitation; 2. Cohesion; 3. Adhesion, including Capillary A.; 4. Chemical Affinity; 5. The attractions of Electricity, Magnetism, etc. See GRAVITATION: COHESION, etc., as above. Attempts have been made to deduce all these phenomena from one principle of A., modified by an opposing force of repulsion, but as yet without success. Still less can they be explained by assuming only *one* force—A. alone, or repulsion alone—for this, too, has been

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attempted. The idea of an attractive force acting as the bond of the universe was first introduced as a scientific hypothesis by Newton, and was violently combated by Leibnitz and others.

ATTRAHENT, a. *ăt-tră-hěnt* [L. *attrahen'tem*, drawing to—from *ad*, to; *traho*, I draw]: drawing or attracting.

ATTRECTATION, n. *ăt-trěk-tă'shŭn* [L. *attrectatio*—from *attrecto*, to touch, to handle—from *ad*, to; *tracto*, to drag about—freq. from *traho*, to draw]: the act of handling frequently; the state of being frequently handled.

ATTRIBUTE, v. *ăt-trīb'ūt* [F. *attribut*, an attribute—from L. *attribūtus*, given or assigned to—from L. *ad*, to; *tribūtus*, granted; bestowed]: to make over to; to give as due; to ascribe to. ATTRIB'UTING, imp. ATTRIBUTED, pp. *ăt-trīb'ū-těd*. ATTRIBUTE, n. *ăt-trīb'ūt*, a quality considered as belonging to, or inherent in, any person or thing. ATTRIBUTIVE, a. *ăt trīb'ū-tīv*, pertaining to an attribute: N. in *gram.*, applied to words, as adjectives, which denote an attribute. ATTRIBUTABLE, a. *ăt-trīb'ū-tă-bl*, that may be ascribed to. ATTRIBUTION, n. *-bŭ'shŭn* [F.—L.]: the act of attributing to; commendation.—SYN. of 'attribute, v.': to ascribe; impute; assign;—of 'attribute, n.': property; quality; symbol.

ATTRIBUTE, in the Fine Arts: a species of symbol, consisting of a secondary figure or object accompanying the principal figure—as the trident of Neptune, or the owl of Minerva. Attributes serve to mark the character meant, and add to the significance of the representation. The necessity of using them lies in the limited means of expression possessed by the formative arts. Attributes may be either essential or conventional. Essential attributes have some real relation or resemblance to the object or idea to be expressed; and are often such as could stand alone as symbols—as the bee, representing diligence. Attributes in the strictest sense, and as distinguished from symbols, are such as are significant only in connection with a figure, to which they in a manner belong; e. g., the wings of genii, the finger on the mouth of Harpocrates. The last is an example of an accidental or conventional A., of which kind are also the *anchor*, to express hope; the *cross*, faith. Common attributes in Christian art are—the harp for King David, and writing materials for the evangelists, especially the apostle John.

ATTRIBUTE, in Logic: the opposite of *Substance*. The latter is considered as self-existent, while the former can be conceived as possessing only a dependent existence. Attributes are commonly said to belong to substances. Thus, wisdom, holiness, goodness, and truth are termed attributes of God, who is himself regarded as the substance in which they inhere; in like manner, whiteness is called an A. of snow.

ATTRITION, n. *ăt-trīsh'ŭn* [F. *attrition*—from L. *attritiōnem*—from *attritus*, rubbed or worn away—from L. *ad*, to; *tritus*, rubbed]: the act of wearing by rubbing; state

ATTUNE—ATWOOD'S MACHINE.

of being worn by friction; the least measure of sorrow, or lowest degree of repentance, the result of fear—as opposed to *contrition*, the highest degree or real repentance. **ATTRITE**, a. *ăt-trit'*, in *OE.*, worn by rubbing; penitent. **ATTRITENESS**, n. *ăt-trit'nēs*, the quality of being rubbed away or worn down by friction.

ATTUNE, v. *ăt-tūn'* [L. *ad*, to, and *tune*]: to put in tune; to make musical; to arrange fitly. **ATTUN'ING**, imp. **ATTUNED**, pp. *ăt-tūnd'*.

ATUA, n. *ă-tū-ă*, or **AKUA**, n. *ă-kū-ă* [Polynesian *Atu*, Master or Lord—primarily, core or kernel]: the chief word for God throughout eastern Polynesia—meaning primarily, 'He who is the very core and life of man.'

ATUN, n. *a-tūn'*: a fish, the *Thyrsites atun*, belonging to the family of *Trichiuridae*, or *Hair-tailed* fishes. It feeds voraciously on the calamary, is found in the ocean near s. Africa and Australia, and is prized for the delicacy of its flesh.

ATWAIN, ad. *ă-twān'* [AS. *a*, in, and *twain*]: in *OE.*, in twain; asunder.

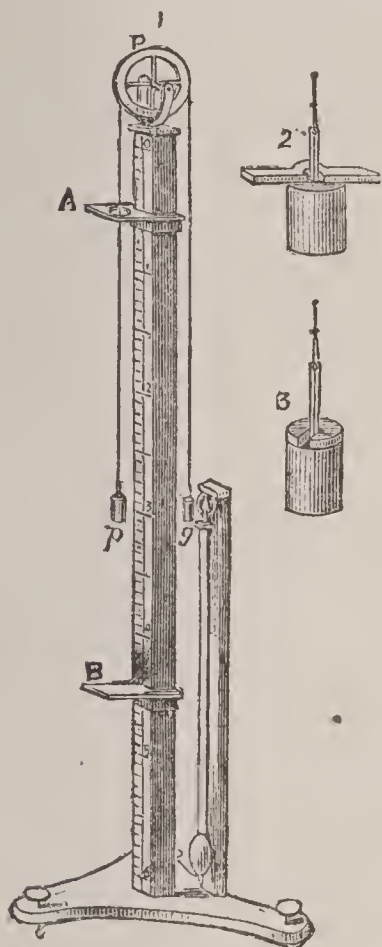
ATWEEN, or **ATTWEEN**, ad. a. prep. *ă-twēn'* [AS. *a*, in; *twegen*, two, twain]: in *prov. Eng.*, in the middle of two things; between; in *Scot.*, occupying a middle position, as 'atween the twa.' **ATWO**, ad. *ă-tō'*, in *OE.*, into two.

ATWIXT, prep. *a-twikst'* [O. Eng. form of betwixt—from AS. *a*; *tweah*, two]: betwixt.

ATWOOD'S MACHINE': an instrument for illustrating the relations of time, space, and velocity in the motion of a body falling under the action of gravity. It was invented by George Atwood, or Attwood, a mathematician of some eminence (1745–1807), educated at Cambridge, who became fellow and tutor of Trinity College in that univ., and published a few treatises on Mechanics and Engineering. It is found that a body, falling freely, passes through 16 ft. in the first second, 64 ft. in the first two seconds, 144 ft. in the first three seconds, and so on. Now, as these spaces are so large, we should require a machine of impracticable size to illustrate the relations just mentioned. The object of Atwood's Machine is to reduce the scale on which gravity acts without in any way altering its essential features as an accelerating force. The machine consists essentially of a pulley, P (see Fig. 1), moving on its axis with very little friction, with a fine silk cord passing over it, sustaining two equal cylindrical weights, *p* and *g*, at its extremities. The pulley rests on a square wooden pillar, graduated on one side in feet and inches, which can be placed in a vertical position by the levelling-screws of the sole on which it stands. Two stages, A and B, slide along the pillar, and can be fixed at any part of it by means of fixing-screws. One of these stages, A, has a circular hole cut into it, so as to allow the cylinder, *p*, to pass freely through it; the other is unbroken, and intercepts the passage of the weight. A series of smaller weights, partly bar-shaped, partly circular, may be placed on the cylinders

ATWOOD'S MACHINE.

in the way represented in Figs. 2 and 3. A pendulum usually accompanies the machine, to beat seconds of time. The weight of the cylinders, p and g , being equal, they have no tendency to rise or fall, but are reduced, as it were, to masses without weight. When a bar is placed on p , the motion that ensues is due only to the action of gravity upon it, so that the motion of the whole must be considerably



Atwood's Machine.

ably slower than that of the bar falling freely. Suppose, for instance, that p and g are each $7\frac{1}{2}$ ounces in weight, and that the bar is 1 ounce, the force acting on the system—leaving the friction and inertia of the pulley out of account—would be $\frac{1}{16}$ of gravity, or the whole would move only 1 ft. in the first second, instead of 16. If the bar be left free to fall, its weight or moving force would bring its own mass through 16 ft. the first second; but when placed on p , this force is exerted not only on the mass of the bar, but on that of p and g , which is 15 times greater, so that it has altogether 16 times more matter in the second case to move than in the first, and must in consequence, move it 16 times more slowly. By a proper adjustment of weights, the rate of motion may be made as small as we please, or we can reduce the accelerating force to any fraction of gravity. Suppose the weights to be so adjusted that under the

moving force of the bar or circular weight the whole moves through 1 inch in the first second, we may institute the following simple experiments: *Experiment 1.*—Place the bar on p , and put the two in such a position that the lower surface of the bar shall be horizontally in the same plane as the 0 point of the scale, and fix the stage A at 1 inch. When allowed to descend, the bar will accompany the weight, p , during one second and for 1 inch, when it will be arrested by the stage A, after which p and g will continue to move from the momentum they have acquired in passing through the first inch. Their velocity will now be found to be quite uniform, being 2 inches per second, illustrating the principle that a falling body acquires, at the end of the first second, a velocity per second equal to twice the space it has fallen through. *Exp. 2.*—Take, instead of the bar, the circular weight, place the bottom of p in a line with the 0 point, and put the stage B at 64 inches. Since the weight accompanies p throughout its fall we have in this experiment the same conditions as in the ordinary fall of a body. When let off, the bottom of

ATYA—AUBAINE.

the cylinder, *p*, reaches 1 inch in 1 second, 4 inches in 2 seconds, 9 inches in 3 seconds, 16 inches in 4 seconds, 25 inches in 5 seconds, 49 inches in 7 seconds, and 64 inches and the stage in 8 seconds—showing that the spaces described are as the squares of the times. *Exp.* 3. If the bar be placed as in *Exp.* 1, and the stage A be fixed at 4 inches, the bar will accompany the weight, *p*, during two seconds, and the velocity acquired in that time by *p* and *g* will be 4 inches per second, or twice what it was before. In the same manner, if the stage A be placed at 9, 16, 25, etc., inches, the velocities acquired in falling through these spaces would be respectively 6, 8, 10, etc., inches—two inches of velocity being acquired in each second of the fall. From this it is manifest that the force under which bodies fall is a uniformly accelerating force—that is, adds equal increments of velocity in equal times. By means of the bar and the stage A, we are thus enabled to remove the accelerating force from the falling body at any point of its fall, and then question it, as it were, as to the velocity which it has acquired.

ATYA, n. *a-tī'a* [from *Atys*: Gr. *Atus*, the name of several persons mentioned in classic history or mythology. The most notable was an effeminate and foppish youth, killed by Tydeus in the Theban war]: name given by Leach to a genus of decapod long-tailed crustaceans. They have the forceps terminating the four claws cleft as far as its base, or appearing to be composed of two fingers in the form of lashes united at their origin. •

ATYPIC, a. *a-tīp'ik* [Gr. *a*, without: L. *typus*—from Gr. *tupos*, a model, a type]: in *nat. sci.*, not having typical characters.

ATYPUS, n. *a-tī'pūs* [Gr. *a*, without; *tupos*, a type]: genus of spiders belonging to the the family *Mygalidæ*. The *A. Solzeri* excavates in the ground, to the depth of seven or eight inches, a cylindrical tube, which it lines with silk. It is found in France.

AUBAGNE, *ō-bāñ* (anc. *Albania*): town of the dept. of Bouches-du-Rhone, France; on the Huveaune, 9 m. e. from Marseilles, with which it is connected by railway. It is built with some regularity and elegance. The ancient town stood on a hill, at the base of which the present town is situated. It was the cap, of the Albicii, subdued by Julius Cæsar. The castle, once of great strength, is now in ruins. The church was founded 1164. This town is a place of considerable activity, manufacturing pottery tiles, paper, etc. It has tanneries and distilleries. Pop. 5,200.

AUBAINE, n. *ō-bān'* [F. *aubaine*, escheat, right of succession in a sovereign to an alien's goods—from *aubain*, a foreigner]: in France, the right in succession of the sovereign to the goods of a foreigner not naturalized, at his death—abolished 1819; anciently the barbarous right of the sovereign to wrecked vessels and goods, and the power to kill or sell the alien sailors as slaves. See ALBAINS.

AUBE—AUBER.

AUBE, *ôb*: river in France; tributary of the Seine, rising near Pralay, on the plateau of Langres; flowing n. w. by Rouvres, La Ferté, Bar, and Arcis; and falling into the Seine at Pont-sur-Seine, after a course of 90 m.

AUBE: a dept. of France, occupying the s. part of the old prov. of Champagne, and a small portion of Burgundy: bounded on the n. by the Marne; e. by the Haute-Marne; s.w. by the Yonne; n.w. by the Seine-et-Marne. The e. part belongs to the basin of the A; the w. to the basin of the Seine. Area, 2,310 sq. m. The climate is mild, moist, and changeable; but on the whole healthful. A great portion of the area is arable land. The n.e. is applied chiefly to pasturage; but the s.e. is far more fertile, rich in meadow-land and forest, and producing grain, hemp, rape, hay, timber, and wine. In minerals the department has little besides limestone, marl, and potters' clay. The chief manufactures are woolen cloth, cotton and linen goods, ribbons and stockings, leather, parchment, etc. The sausages and bacon of A. have long been famous. *Troyes* is the cap. Pop. (1901) 246,163.

AUBENAS, *ôb-nâ'*: town in France, dept. of Ardèche; picturesquely situated on the right bank of the Ardèche, 14 m. s.w. from Privas, in the middle of the volcanic region of Vivarais. From a distance its appearance is good, but the streets, with the exception of one traversed by the diligence, are narrow and crooked, the squares small, and the houses very irregularly built. An old and rapidly decaying wall, flanked with towers, girds the town, which contains an ancient castle. A. is the principal mart for the sale of chestnuts and silk in the department. Several important fairs are also held here. It has manufactures of silk, paper, cotton, coarse cloths, leather, etc., the machinery of the mills being driven by water. Pop. (1891) 7,824.

AUBER, *ô-bair'*, DANIEL FRANÇOIS ESPRIT: 1784, Jan. 29—1871, May 14; b. Caen, Normandy; composer of operas. His father was a print-seller in Paris, and sent his son to London to learn the trade. But his irresistible passion was for music, and he soon returned to Paris. Among his earliest compositions may be noticed—the *concertos* for the violoncello, ascribed to Lamare the violoncellist; the concerto for the violin, played by Mazas with great applause at the Conservatory of Music, Paris; and the comic opera, *Julie*, with a modest accompaniment for two violins, two altos, and a bass. These works were very successful; but A., aspiring to greater things, now engaged in a deeper study of music under Cherubini, and wrote a mass for four voices. His next work, the opera *Le Séjour Militaire* (1813), was so coldly received that A. grew disheartened, and resolved to abandon the idea of reaching eminence as a musical composer. However, the death of his father compelled him to be dependent on his own resources; and in 1819 appeared *Le Testament et les Billets-doux*, also unsuccessful; but in *La Bergère Châtelaine* he laid the foundation of his subsequent fame. In

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all these early essays, as well as in the opera of *Emma* (1821), his style was original; but afterwards he became an imitator of Rossini, and disfigured his melodies with false decorations and strivings for effect. All his latter works excepting *La Muette de Portici* (Masaniello), 1828, are written with an assumed mannerism, but in a light and flowing style, with many piquant melodies which have made the tour of Europe and America. The operas *Leicester* (1822), *La Neige* (1823), *Le Concert à la Cour*, and *Léocadie* (1824), *Le Maçon* (1825), *Fiorella* (1826), *La Fiancée* (1829), *Fra Diavolo* (1830), were followed by a series of lighter works: *L'Elixir d'Amour*, *Le Dieu et la Bajadère*, *Les Faux Monnayeurs*, etc.; the later operas, *Gustave ou le Bal Masqué*, *Le Lac des Fées*, *Le Cheval de Bronze*, *Les Diamants de la Couronne*, *La Part du Diable*, *La Sirène*, and *Haydée*, exhibiting the same popular qualities as their predecessors; but their interest is evanescent, as they are deficient in depth of thought and feeling. His later works are *Jenny Bell* (1855), and *Manon Lescaut* (1856). In 1842, A. was appointed director of the Conservatory of Music, Paris.

AUBERGE, n. *o-bairzh* [Fr.]: an inn; a place of entertainment for travellers.

AUBERGINES, n. pl. *o-bair-zhên* [Fr.]: a name for the fruit of two species of solanum.

AUBERVILLIERS, *ô-bêr-vê-yâ'*: village in France; a suburb of Paris. It is notable for a church known as Notre Dame des Virtus, containing a picture of the Virgin which was believed to possess miraculous powers. A little to the east of A. is a fort constructed in 1842. Pop. nearly 20,000.

AUBIGNÉ, MERLE D': see MERLE D'AUBIGNÉ.

AUBIGNÉ, *ô-bên-yâ'*, THEODORE AGRIPPA D': 1550, Feb. 8—1630, Apr. 29; b. near Pons in Saintonge: famous French scholar. He had remarkable talent for the acquisition of languages. Although of noble family, he inherited no wealth, and chose the military profession. In 1567, he distinguished himself by his services to the Protestant cause, and was rewarded by Henry IV., who made him vice-admiral of Guienne and Bretagne. His severe and inflexible character frequently embroiled him with the court; and in 1620 he betook himself to Geneva, where he died. His best-known work is his *Histoire Universelle*, 1550-1601 (Amst. 1616-20), which was burned in France by the common hangman, as also his *Histoire Secrète, écrite par lui-même* (1721). His spirit of biting satire appears in his *Confession Catholique du Sieur de Sancy* and *Adventures du Baron de Foeneste*. His complete works are published in 5 vols. (Par. 1873); and Lives of him by Réaume (Par. 1883), Morillot (Par. 1884), and Von Salis (Heidelb. 1884).

AUBRY DE MONTDIDIER, *ô-bre' deh môn-de-de-â'*: a French knight in the time of Charles V.; assassinated, as tradition says, in the forest of Bondy by Richard de Macaire, 1371. The latter became suspected of the crime

AUBURN.

on account of the dog belonging to the deceased Aubry invariably showing towards him an unappeasable enmity. Macaire was therefore required by the king to fight with the animal in a judicial combat, which was fatal to the murderer. This tale was afterwards, under the titles of *Aubry's Dog*, *The Wood of Bondy*, *The Dog of Montargis*, frequently acted, the 'dog' always gaining the greatest share of applause. After being performed with success at Vienna and Berlin, it was appointed to be played at the Weimar Theatre, of which Goethe was the manager; but the poet resigned his office before the dog made his début.

AUBURN, a. *aw'bern* [OF. or Sp. *albran*, a wild duck in its first year, having generally a peculiar brown: mid. L. *alburnus*, light colored—from L. *albus*, white]: of a tan or dark color; of a rich chestnut color.

AUBURN, *aw'bern*: flourishing city, cap. of Androscoggin co., Maine; on the Androscoggin river (by which it is separated from Lewiston City), and on the Maine Central R.R., 34 m. n. from Portland. Its principal manufactures are cotton, boots, and shoes. It has two national banks, a court house, six churches, two savings-banks, two newspapers, a furniture factory, a large cotton-mill, foundry, and the Auburn high school. The capital employed in the shoe manufacture is over a million dollars, turning out annually more than four million pairs of shoes, valued at about \$3,600,000. Pop. (1890) 11,228; (1900) 12,951.

AUBURN: city, cap. of Cayuga co., N. Y., 25 m. from Syracuse by the New York Central R. R., 2 m. from Owasco Lake, 9 m. from Skaneateles; pleasantly situated on elevated, undulating ground, and has wide thoroughfares lined with shade-trees. Genesee st. is the principal thoroughfare, and contains the handsome county courthouse and other prominent public buildings. The most remarkable institution here is the Auburn state prison, whose vast and massive structures stand near the depot, and cover eighteen acres of ground, enclosed by a stone wall 3,000 ft. long and from 12 to 35 ft. high. This prison is conducted on the 'silent system,' and usually contains over 1,000 prisoners employed in mechanical labors.

A. has a Presbyterian theological seminary, founded 1821, an academy, and five public schools. There are 16 churches, 2 national banks (cap. \$400,000), 2 savings banks, 2 private banks, 2 opera-houses, 2 daily, 5 weekly, 1 monthly, and 1 quarterly periodicals, and an orphan asylum. On Fort Hill, in the suburbs, is a pleasant cemetery, where lie the remains of William H. Seward, whose home was in A. Owasco Lake, 2 m. from A., is 11 m. long and about a mile wide, surrounded by hills. Here a small steamer plies in summer, and the neighborhood is a favorite summer resort with the citizens of A. The outlet of Owasco Lake runs through the town, furnishing water-power which is utilized by many manufacturing establishments, whose products include cotton and woolen goods, carpets, agricultural implements and other tools, paper, flour, and beer. In 1900 the different manufacturing industries had 316 estab-

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lishments, \$12,810,363 capital, and 6,530 hands; paid \$2-706,948 for wages, and \$5,630,925 for materials; and received \$10,591,109 for products. Pop. (1900) 30,345.

AUBUSSON, *ô-büs-sôn'*: town of the dept. of Creuse, France, 125 m. w. from Lyons; picturesquely situated on the Creuse, in a narrow valley or gorge, surrounded with mountains and rocks. It is well built, consisting chiefly of one broad street. It is celebrated for the manufacture of carpets, said to have been introduced by the Arabs or Saracens, who settled here in the 8th c. Tanning and dyeing are carried on, and there is some trade in wine. Pop. 7,000.

AUBUSSON, *ô-bü-sôn'*, PIERRE D', grand master of the order of St. John of Jerusalem: 1423-1503; b. of an ancient and noble French family. His early history is imperfectly known, but he is said to have borne arms, when very young, against the Turks in the wars in Hungary, and to have distinguished himself by zeal and valor. Here he acquired that intense antipathy to the 'Infidels' which subsequently animated his whole public career, and gave a peculiar bias to his ambition. Having returned to France, he accompanied the dauphin in his expedition against the Swiss. His mind, however, constantly reverted to the ominous encroachments in the East of the dreaded Mussulman, and at last he enrolled himself at Rhodes among the brotherhood of Christian knights, from which time his history emerges into clear light. He swept the Levant, and chastised the pirates who prowled perpetually among the Greek isles. In 1458, he succeeded in forming a kind of Christian league between the French monarch and Ladislaus, King of Hungary, against Mohammed II. He was continually impressed with the necessity of a vast organization of all Christendom to overthrow the power of the Turks. Step by step he won his way to supreme power in his order. In 1476 he was elected grand master. It was a critical period for the civilization and religion of Europe. Constantinople had recently been taken and the Byzantine empire destroyed by Mohammed II. Every day the conqueror marched further west. Thrace, Macedonia, Central Greece, Servia, Wallachia, Bosnia, Negropont, Lesbos, and the islands of the Adriatic had been successively conquered by him. Proud of his rapid success, and sustained by an immense prestige, the sultan threatened to dictate terms from Rome to the entire West. Rhodes, however, stood in his way, the sentinel isle of Christianity, on the great maritime route between Asia and Europe. Mohammed saw that here the battle between the two faiths must be joined; and in 1480, May, a Turkish army of 100,000 men, commanded by a Greek renegade, Palæologos, landed in the island and began the siege of the town. Two desperate assaults were made. The Turks were repulsed, and sailed away, leaving 9,000 dead. Mohammed was enraged, and planned a second expedition, which was interrupted by his death at Nicomedeia, in Asia Minor, 1481, May. After this A. was prominent in the religious diplomacy of the papal court. Meanwhile his exertions to

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improve the internal organization of the brotherhood excited admiration throughout Christendom. At the age of 78 he was appointed generalissimo of the forces of the German emperor, the French king, and the pope against the Turks; and enthusiastically entered on his duties, and sailed to attack Mitylene; but the expedition failed on account of the discordant aims of the various belligerents. Broken by disappointment and vexation, the grand master returned, and died at Rhodes.

AUCH, *ōsh*: cap. of the dept. of Gers, in the s. of France; on the river Gers, 42 m. w. of Toulouse; lat. 43° 33' n., long. 0° 35' e. It is the seat of an abp., and has a museum of natural science, with an old and beautiful cathedral, the painted windows of which are greatly admired. Its chief articles of trade are woolen and cotton stuffs, fruits, wine, and brandy.

In ancient times it was called *Elimberis*; and at a somewhat later period took its name from the Auscii, whose chief town it was. In the 8th c., it became the cap. of Gascony; and later, of the county of Armagnac. Pop. (1896) 14,838.

AUCHAN, n. *aw'kan*, or ACHAN, n. *ā'chan* [deriv. uncertain]: a kind of pear.

AUCHENIA, *aw-ke'nī-a* [from the Gr. *auchen*, the neck]: genus of ruminating quadrupeds, of which the Llama (q.v.) and the Alpaca (q.v.) are best known. The genus is exclusively S. American; indeed, the species occur only on the lofty ranges of the Andes. They are nearly allied to the camels, and may be regarded as their representatives in the zoology of America. They form, with them, the family *Camelidæ* (see CAMEL), and were included by Linnæus in the genus *Camelus*. They agree with the camels in certain important anatomical characters, particularly in the structure of the stomach; and resemble them very much in general form.

AUCHMUTY, RICHARD TYLDEN: an American philanthropist; b. in New York city 1831. He practiced architecture for many years; served through the Civil War in the Union Army; afterward retired from business. With his wife he founded the New York Trade Schools at a cost of \$250,000, on a plan which was entirely original, and which was made permanent in 1892 by an endowment of \$500,000 by J. Pierpont Morgan. D. 1893, July 18.

AUCHTERARDER, *ōk'tēr-ar'dēr*: village in the s.e. of Perthshire, on the w. of the Scottish Central railway. The chief employment is cotton-weaving. The popular opposition to the presentee to the church of A. originated (1839) the struggle which ended in the secession from the Church of Scotland and the formation of the Free Church, 1843. Pop. over 3,000.

AUCK'LAND: the northern provincial dist. of New Zealand, including fully a half of North Island, abt. 400 m. long by 200 wide at its greatest breadth. A. has a coast line of nearly 1,200 m.; and is remarkable for its rivers, which serve as carriage-ways for the produce of the in-

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terior. There are three almost natural divisions of this district: North Peninsula, East Coast, and the Waikato Country—the latter two mainly in the hands of the natives. Gold, copper, tin, iron, coal, and other minerals are in A. The value of the gold exported 1857–82 was £4,917,780. A. is very rich in timber, the most important tree being the Kauri pine. The fossil gum found wherever the Kauri forests have been is an important article of export. Much New Zealand flax is grown. In 1881, the total value of the exports was £813,113; including wool, Kauri gum (£253,728), timber, flax, and gold. The imports were valued at £1,490,124. The climate of A. is pleasant and healthful. Volcanic action has deeply left its mark on the surface of A.: there is still an active volcano near the city of Auckland; and the warm lake and geyser scenery of the region is very remarkable. A. is now called strictly, not province, but ‘provincial district.’ Pop. (1875) 79,104; (1881) 99,451; (1891) 133,267; (1901) 175,938.

AUCKLAND: second city of New Zealand, on the Hauraki Gulf: till 1865, cap. of New Zealand, when the seat of govt. was transferred to Wellington. A. is distant from Sydney 1,236 m.; from Melbourne, 1,650. Picturesquely situated, its position for commerce is also excellent, as in addition to its harbor at Waitemata it has also a western harbor, the Manakau, 6 m. distant. There is a wharf 1,690 ft. in length. A. is surrounded by numerous thriving villages, with several of which it is connected by railway. It contains a well laid-out botanical garden, and numerous public buildings, government house, barracks, etc. It supports two daily papers. About 230 sailing-vessels and 62 steamers are registered as belonging to A. A. was founded 1840. The temperature appears to be singularly equable. The mean of the coldest month is 51° F., and that of the warmest 68°. The annual rainfall is 45½ inches; and the days of rainfall average 100. Pop. (1901) 34,213; but including suburban districts, 67,226.

AUCKLAND, *awk'land*, BISHOP: town in the middle of the county of Durham; on an eminence, 140 ft. above the plain of the Wear. A. contains the abbey-like palace of the bishop of Durham. Pop. (1881) 10,087.

AUCKLAND, Earl of, GEORGE EDEN, Gov. Gen. of India: 1784–1849, Jan. 1; son of William Eden, Lord Auckland, whom he succeeded, 1814, as Lord A. He joined Earl Grey's administration, 1833, Nov., and in July following, in Viscount Melbourne's first ministry, he became first lord of the admiralty. He vacated that office in Nov., but was appointed again, 1846. In 1835, he went out to India as gov.-gen., and returned to England, 1841.

AUCKLAND, Lord, WILLIAM EDEN: 1744–1814, May 28; third son of Sir Robert Eden, Bart., of West Auckland, Durham. He was educated at Eton and Oxford, and called to the bar 1768. In 1772, he was appointed under-sec. of state, and afterwards filled the positions of a lord of trade, a commissioner to treat with the insurgent colonists of North America, chief sec. to the lord

AUCKLAND ISLANDS—AUCTIONEER.

lieut. of Ireland, minister plenipotentiary to France (concluding a commercial treaty with that country, 1786), ambassador to Spain, ambassador to Holland, and joint-post-master-gen. In 1788, he was created an Irish peer as Baron A., and in 1793 a British baron. A. was the author of the *Principles of the Penal Law* (1771, 8vo); *Remarks on the Apparent Circumstances of the War* (1795); *Speech on the Income-tax* (1799); *Speech in Support of the Union with Ireland* (1800); and other pamphlets.

AUCKLAND ISLANDS: group of islands s. of New Zealand, abt. the 51st parallel s., and the 167th meridian e. The largest of them measures 30 m. by 15. It has two good harbors, and is covered with the richest vegetation. The Auckland Islands are valuable chiefly as a whaling station, being at the confluence, as it were, of the Pacific and Southern oceans.

AUCTION [from the Latin *auctio*, increasing or enhancement]: a sale conducted in a manner to increase the price of goods by stimulating purchasers. This definition, however, does not apply in the case of what is known as 'Dutch Auction' (properly no auction at all), in which the usual process is reversed, and a price is put by the auctioneer upon the goods offered, which price is reduced till it reaches a sum which some purchaser is willing to give. The word A. and the mode of sale are both of Roman origin, and the system is believed to have been first employed in the disposition of spoils of war, when a spear was stuck into the ground to attract customers, and the sale was said to occur *sub hasta* (under the spear). Auctions are conducted under 'specific conditions of sale,' these being the terms, and, in fact, a portion of the contract between buyer and seller. The fall of the auctioneer's hammer is accepted as concluding the sale, unless some other means are specified in the conditions. These conditions usually accompany the catalogue and description of the article or articles offered for sale; and the descriptions, etc., are obliged by law to be honest, and to describe as faithfully as is practicable the character and condition of the object or right to be disposed of. Conditions which are binding to seller and purchaser alike, are—1st, no attempt shall be made by the seller by means of fictitious offers to enhance the selling price of his goods; 2d, that no combination or conspiracy among purchasers to prevent competition shall be permitted. In the conduct of auctions the exposor or seller may fix an 'upset price' on his goods, or may reserve any portion of them to himself, unless the same be declared to be 'without reserve,' in which case all bidding or reservation in behalf of the seller is barred.

AUCTION, n. *awk'shŭn* [L. *auctiōnem*, increase]: a public sale of any description of property to the highest bidder. AUCTIONARY, a. *-ēr-ĭ*, pertaining to. AUCTIONEER, n. *awk'shŭn-ēr'*, one empowered to sell property by auction. V. to dispose of goods by auction. AUCTIONEERING, n.

AUCTIONEER, *awk'shŭn-ēr'*: the person who conducts

AUCUBA—AUDÆUS.

an auction (q.v.). The A. is in a certain sense the agent both of seller and purchaser, and by the fall of his hammer, or by writing the purchaser's name in his book, he binds him to accept the article sold at the price indicated. The A. may also, and frequently does, act as agent for absent purchasers, or for persons who have instructed him to make biddings for them during the sale. In both cases, however, the purchaser must be *bona fide*, otherwise the A. would himself become a 'puffer.' Where the A. declines or omits to disclose the seller's name, he undertakes his responsibilities to the purchasers. To the seller, again, he is responsible for ordinary skill, assiduity, and prudence.

AUCUBA, *aw'kū-ba*: genus of plants of the nat. ord. *Cornacæ* (q.v.) of which the only known species is *A. Japonica*, an evergreen shrub resembling a laurel, but with dichotomous or verticillate yellow branches, and, as seen in Europe, always with pale green leaves curiously mottled with yellow. It is diœcious, produces its small purple flowers in summer, and ripens its fruit, a small red drupe, in March. It is a native of China and Japan, and is now known to be at least as hardy as the common laurel. It is often called the Variegated Laurel, and is a very common ornamental shrub. The mottled appearance of the leaf is said, however, not to belong to the plant in its ordinary natural state; but only this variety has yet been brought to Europe, and of it only the female plant.

AUDACIOUS, a. *aw-dā'shūs* [F. *audacieux*; It. *audace*, audacious; F. *audace*; L. *audāciŭs*, boldness—from L. *audācem*, bold]: very bold and daring; impudent; forward. AUDA'CIOUSLY, ad. *-lī*. AUDACITY, n. *aw-dās'i-tī*, boldness; impudence. AUDA'CIOUSNESS, n. the quality of being audacious.—SYN. of 'audacity': effrontery; hardihood; hardiness; boldness.

AUDÆUS, *aw-dē'ūs*, AUDI'US (or, according to his native Syriae name, *Udo*): d. abt. 370: founder of a religious sect in Mesopotamia. He commenced by accusing the regular clergy of worldliness, impure morals, etc., and is said to have opposed to their manner of life a strict asceticism. His conduct and his doctrine seemed dangerous to the welfare of the church, and he was excommunicated. His somewhat numerous disciples then clung more closely to him, and he was elected their bishop. In 338, he was banished to Scythia, where he instituted a kind of rival church, and where he died. Modern knowledge of his character and opinions is derived from unfriendly authorities, such as Augustine, Athanasius, etc., therefore to be accepted with caution. But his labors among the fierce barbarians in the north are acknowledged to have been beneficial, and one writer, Epiphanius, states that he ought to be considered *schismatical*, but not *heretical*. But if the leading feature of his system was, as is alleged, a decided tendency to anthropomorphism, it does not appear—according to the principles upon which the church usually proceeded—why he should not have been called a heretic. He is said to have

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held that the language of the Old Testament justifies the belief that God has a sensible form—a doctrine deemed heretical in all ages of the church's history. This particular tenet took firm hold on many minds, and in the subsequent century was widely spread through monasteries of Egypt. AUDÆ'ANISM, or AUDI'ANISM, the doctrine of A. AUDÆ-ANS, followers of Audæus.

AUDE, *ôd* (*Atax*): river in the s. of France; rises in the e. Pyrenees, not far from Mont Louis; flows for some time parallel to the canal of Languedoc; and falls into the Mediterranean 6 m. e.n.e. of Narbonne, after a course of more than 120 m.

AUDE: maritime dept. in the s. of France. It comprises some old 'counties' formerly a portion of the province of Languedoc: 2,430 sq. m. The s. part of A. is mountainous, but the greater portion of it belongs to the valley of the lower A. and the canal of Languedoc. Its n. boundary is formed by the Black Mountains, the most southerly offsets of the Cevennes. The coast is flat, with no bays or roadsteads, but several lagunes. The climate is warm, but variable. The mountains are composed of granite, while the soil of the plains is chiefly calcareous, and near the coast—where salt and soda are procured—is extremely fertile, producing cereals, olives, fruits, and wines. A. is rich in iron and coal, and mineral springs. The woolen and silk manufactures are of considerable value. There is considerable export of corn, honey, etc. Chief town, Carcassonne. Pop. of A. (1891) 317,372; (1901) 313,531. (1891) 317,372.

AUDEBERT, *ôd bair'*, JEAN BAPTISTE: distinguished French naturalist; 1759–1800; b. Rochefort; studied the arts of design and painting at Paris; and in early life gained eminence as a miniature-painter. Having been much employed by naturalists in painting the more rare and beautiful objects in their collections, he published on his own account (Paris, 1800) a splendid volume, which raised him at once to celebrity, both as painter and author. This work, the *Historie Naturelle des Singes, des Makis, et des Galéopithèques* (Natural History of Monkeys, Lemurs, and Flying Lemurs), was a large folio, with 62 colored plates, remarkable for truth and beauty. His method of color-printing in oil, then novel but now common, was to dispose all the colors on one plate instead of using a separate plate for each color. His use of gold and bronze in the illustrations and letterpress was also new. In his *Histoire des Colibris, des Oiseaux-mouches, des Jacamars et des Promérops* (Natural History of Humming birds, Jacamars, and Prome-ropses), he gave his plates even greater brilliancy and finish.

AUDIBLE, a. *aw'dĩ-bl* [mid. L. *audib'ilis*, that may be easily heard—from L. *audĩō*, I hear: It. *audible*, audible]: that may be heard; loud enough to be perceived by the ear. AU'DIBLY, ad. *-bli*, in a manner to be heard. AUDIBLENESS, n. *aw'dĩ-bl-něs*, the quality of being audible. AU'DIBIL'ITY, n. *-bĩl'ĩ-tĩ*, the being loud enough to be heard. AUDIENCE, n. *aw'dĩ-ěns* [F.—L. *audiēn'tiā*, hearing]: admittance to a hearing; an interview; an assembly of hearers. AU'-

AUDIOMETER—AUDITA QUERELA.

DIENCE CHAMBER, n. *chām'bēr*, a chamber in which audiences are granted. AU'DIENCE COURT, n. *cōrt*, a court belonging to the Abp. of Canterbury. Being accustomed formerly to hear causes extra-judicially in his own palace, he usually requested that difficult points should be discussed by men learned in the law, called *auditors*, whence ultimately sprang up by degrees a court held to have equal authority with that of Arches, though inferior to it both in dignity and antiquity. The audience court is now merged in the Court of Arches, the duties of its former presiding officer being discharged by the Dean of the Arches.

AUDIOMETER, n. *aw-dī-ōm'ēt-ēr*, or AUDIMETER, n. *aw-dīm'ēt-ēr* [L. *audio*, I hear; Gr. *metron*, measure]: an instrument devised by Prof. Hughes, the inventor of the microphone, and described by Dr. Richardson at a meeting of the Royal Soc., 1879. Its object is to measure with precision the sense of hearing. Among its constituent parts are an induction coil, a microphone key, and a telephone.

AUDIPHONE, *aw'dī-fōn*: an invention by Mr. Rhodes of Chicago, to assist the hearing of deaf persons in whom the auditory nerve is not entirely destroyed. The instrument, made of a thin sheet of ebonite rubber or hard vulcanite, is about the size of a palm-leaf fan, with a handle and strings attached to bend it into a curving form, and a small clamp for fixing the string at the handles. The A. is pressed by the deaf person using it against his upper front teeth, with the convex side outwards; when so placed it communicates the vibrations caused by musical sounds or articulate speech to the teeth and bones of the skull, thence to the organs of hearing. For different sounds, it requires to be focused to different degrees of convexity. A simple strip of fine glazed mill-board has been recommended by some experimenters as cheaper and equally serviceable; and birch-wood veneer has been used with success for the same purpose.

AUDIT, n. *aw'dīt* [L. *audit*, he hears; *audītum*, a hearing, a report—from *audīō*, I hear]: an examination of accounts by a person or persons appointed for the purpose, in order to ascertain whether they be correct; final account: V. to examine and settle as to the correctness of accounts. AU'DITING, imp. AUDITED, pp. *aw'dī-tēd*. AU'DITOR, n. *-dī-tēr*, a hearer; an officer appointed to examine accounts, in behalf either of the government, of courts of law, of corporations, or of private persons. AU'DITORSHIP, n. the office of an auditor. AUDITORY, n. *aw'dī-tēr-ī*, an assembly of hearers: ADJ. able to hear; pertaining to the sense of hearing. AUDITORIUM, n. *aw-dī-tō'rī-ūm* [L. *auditorium*, a lecture-room, a hall of justice]: in ancient churches, the nave; that part of a theatre or public building in which the audience sit. AUDIT HOUSE, n. a house appendant to most cathedrals, and designed for the transaction of business connected with them.

AUDITA QUERELA, used as n. *aw-dī'ta kwě-rē'la* [L.—*lit.* a heard complaint, or a complaint having been

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heard]: in *law*, a writ now rarely used, which stayed judgments, and gave the person against whom it had gone forth a rehearing on the ground that he had a good defense, but that by the forms of law he had no opportunity of making it.

AUDITORY NERVE, in Anat.: the nerve associated with the facial; seventh nerve in order of origin from the brain, counting from the front backwards. The seventh pair consists of the portio dura or facial, the portio mollis or auditory, and a small intermediate portion. The portio mollis apparently commences by some white streaks in the floor of the fourth ventricle; it then runs forward to the back of the petrous portion of the temporal bone, and enters the internal auditory meatus. The facial then leaves it to pass along the canal called the Aqueductus Fallopii, and the auditory divides into two portions, which diverge—the smaller one posterior for the semicircular canals and the vestibule, the other for the cochlea. Those entering the semicircular canals divide into five branches, forming at last a nervous expansion somewhat analogous to the retina. Figs. 1 and 2 represent the Auditory Nerve (1) dividing into its two portions, the lesser branch supplying the semicircular canals (2), the larger branch supplying the cochlea (3). Fig. 1 represents the semicircular canals of the left side, with their bony rings round the

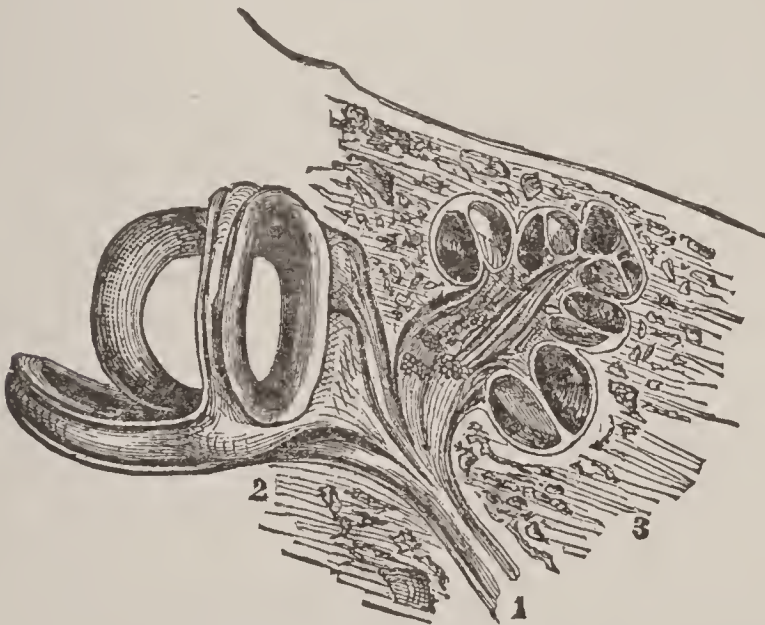


Fig. 1.—Left Auditory Nerve.

membranous labyrinth. In this figure, the cochlea is cut in half, longitudinally from base to apex, showing a section of the spiral canal, with the nerve proceeding up through its axis. Fig. 2 represents the membranous labyrinth (2), with the bony framework cut away, and with the cochlea opened so as to show the manner in which the nerve spreads out in the spiral lamina.

Several theories have been held at different periods with regard to the manner in which the nerves terminate in the cochlea, and how sound is transmitted from the latter to

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the brain. The latest and most widely accepted is that of M. Schultze. It has been shown by experiment, that when a nerve in connection with a muscle is acted upon by a succession of very rapid strokes from the little hammer of



Fig. 2.—Right Auditory Nerve.

a tetanmotor, and when the strokes have arrived at a certain number in the second, a stimulus is sent along the nerve exciting the muscle to action. It is in the same way that M. Schultze supposes the impression of sound to be propagated to the nerves of the cochlea, by means of a series of little tetanmotors called the teeth of Corti, who discovered them. They are situated in the spiral lamina, which separates the spiral canal in the interior of the cochlea into an upper and a lower half or scala. The spiral lamina consists of an osseous septum, next to the central axis of the cochlea, and of a membranous layer, which prolongs the osseous septum to the outer wall of the cochlea, thus completing the spiral lamina. This membranous septum is double, and between its layers there is

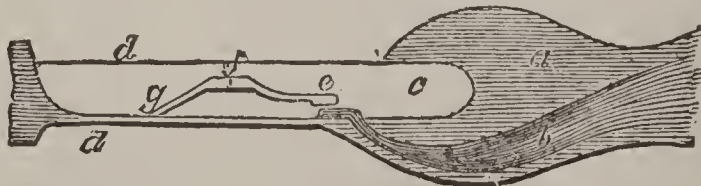


Fig. 3.

a, the osseous septum grooved for the passage of the cochlear nerve, *b*, which terminates by a free end inside the chamber, *c*, along the floor of which it lies for a short distance; *d, d* are the two layers of the membranous septum. Lying in contact with the end of the nerve is the enlarged extremity of a rod, *e*, which is connected in a flail-like manner by the hinge, *f*, to another rod, which is fixed at *g*.

a chamber which contains the teeth of Corti, ranged side by side throughout the whole length of the spiral lamina,

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and gradually growing shorter from base to apex, like the strings of a harp or pianoforte. The chamber is filled up by a tremulous jelly-like fluid. The diagram, Fig. 3, represents a perpendicular section of the spiral lamina. The fluids of the ear receive vibrations for the nerve-endings. The harp-like rods of Corti are supposed to give pitch of sound. When the semicircular canals are cut, the animal becomes dizzy. Dizziness implies loss of our sense of level and direction—functions of the canals.

AUDLEY, *awd'li*, Sir JAMES: d. 1369: one of the original knights of the Order of the Garter, founded 1344 by Edward III., on his return from France after the victory of Cressy. A. accompanied Edward the Black Prince to France, 1346. He was so conspicuously brave at the battle of Poitiers, that the prince retained him as his own knight, and declared him the bravest soldier on his side. He conferred on him an annual revenue of 500 marks, which A. immediately gave up to his squires. This act of disinterestedness became known, and the Black Prince conferred a further annual sum of 600 marks upon him. A. also accompanied the Black Prince into Spain, and in 1369 the office of seneschal of Poitou was conferred upon him. He took part in the capture of La-Roche-sur-Yon in Poitou, in the same year, and died a few months afterwards.

AUDRAN, *ō-drōn'*, GÉRARD: one of the most celebrated engravers of the French school: 1640–1703; b. Lyons; of a family distinguished in this department of art. After three years' residence at Rome, where he studied under Carlo Maratti, and won high repute by his engraving of Pope Clement IX., he was recalled to France by Colbert, and appointed engraver to his majesty Louis XIV. Here he engraved the principal works of Lebrun, with whom he lived in closest friendship. His masterpieces are a series of engravings illustrating the battles of Alexander. He died at Paris.

AUDUBON, *aw'du-bŭn*, JOHN JAMES: distinguished American ornithologist; 1780, May—1851, Jan. 27; b. Lou., of French parentage. Under his father's guidance, the youth conceived a passion for the study of birds; and a book of ornithological specimens determined him to become a draughtsman. About the age of fourteen, he went to Paris, and studied under the celebrated David. In 1798, he was settled on a farm in Pennsylvania by his father, but he did not distinguish himself as an agriculturist. In 1810, he sailed down the Ohio, with his wife and child, on a bird-sketching expedition. The following year, he visited Florida for a like purpose; and for many years he continued his ornithological researches among the American woods, to the neglect of his ordinary business. The latter he finally abandoned; and in 1824 he went to Philadelphia, where he was introduced to Prince Charles Lucien Bonaparte, who so warmly encouraged him in his plans that he determined on publication. After two years' further exploration of the forests of his native country, he came to Europe with the view to secure subscribers for

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his work on *The Birds of America*. He met with a warm reception from such men as Hersehel, Cuvier, Humboldt, Brewster, Wilson, and Sir Walter Scott. The issue of his work was soon commenced, each bird being delineated life-size. The colored engravings were executed chiefly by the late Mr. W. H. Lizars of Edinburgh. The work was completed in 87 parts, elephant folio, containing 448 plates. While the work was in process of publication abroad (it was finished 1839), A. visited America three times, for further researches. In 1831, he began the publication of his *American Ornithological Biography* in Edinburgh, also finished 1839. In 1839, A. finally returned to America, where, in 1844, he published a reduced edition of his works. Assisted by Dr. Buchanan, he published also *The Quadrupeds of America*, and a *Biography of American Quadrupeds*.

AUER, *ow'ér*, ALOIS: 1813, May 11—1869, July 10; b. at Wels, Upper Austria; trained in a printing establishment of his native town to be a compositor, corrector, and manager. During his few leisure moments, A. gained a knowledge of French, Italian, English, and other languages, in which he underwent an examination in 1835 and '86, before the Univ. of Vienna. His brilliant appearance on this occasion opened the way to the chair of Italian in the college at Linz. After travels in Germany, France, and England, he became director of the imperial state-press at Vienna, and in 1860 he was made a knight. He published a work showing the Lord's Prayer in 603 languages; a *Grammatical Atlas*, etc.; and in *Die Entdeckung des Naturselbstdrucks* (1864), he expounded his discovery of NATURE-PRINTING (q.v.). He also made improvements in typographical and mechanical processes.

AUERBACH, *ow'ér-bák*, BERTHOLD: popular German author, of Jewish extraction: 1812, Feb. 28—1882, Feb. 8; b. at Nordstetten, in the Würtemberg Black Forest. He studied at Carlsruhe, Stuttgart, Tübingen, Munich, and Heidelberg. He early abandoned the study of Jewish theology and turned to literature; and is regarded by many as the greatest German writer of fiction. His first publication was on the relation of *Judaism and Modern Literature* (1836). His first novel, *Spinoza*, contained many suggestive philosophical thoughts, and bright sketches of Jewish life; it was followed by a translation of the works of Spinoza (5 vols. Stuttg. 1841). In the *Village Tales* (*Schwarzwälder Dorfgeschichten*, 1843) he showed his power in the charming portraiture of German peasant life; a second series appeared in 1848. *Auf der Höhe* (1865) has been pronounced the best novel in the German tongue. The *Village Tales* were translated into English, Swedish, and Dutch, and were generally admired. Among his works are *Schrift und Volk* (1846); *Das Landhaus am Rhein* (1869); *Wieder unser; Gedenkblätter zur Geschichte dieser Tage* (1871); *Waldfried* (1874). *Brigitta*, published in 1880, dealt with peasant-life in the style of his best village tales.

AUF, n.: see OAF, a silly fellow.

AU FAIT—AUGHT.

AU FAIT, a. *ō fā'* [F., in fact, indeed, in reality]: acquainted with; skilled in.

AUGEAN STABLE, n. *aw-jē'ăn stā'bl*: in Grecian Myth.: a stable belonging to *Augēas*, or *Augeias*, son of Helios and Iphiboë (or Phorbas and Hermione) Augeas was king of Elis, and renowned for his wealth in oxen, of which he fed 3 000 head in his stables. After many years, in which these stables had never been cleaned, Hercules was commissioned by Eurystheus to cleanse them in one day, and was promised as payment a tenth part of the oxen. Hercules accomplished the task, by turning the courses of the rivers Peneus and Alpheus through the masses of ordure. When A. refused to pay the stipulated wages a war ensued, and A. was slain by Hercules. Cleansing the A. stable is the type of a needed, but nearly impossible, reform.

AUGELITE, n. *aw'jēl-īt* [Ger. *augelith*—from Gr. *augē*, bright light, radiance; suffix *ite*]: a colorless or pale-red mineral, with its lustre strongly pearly on cleavage surfaces. The composition is: phosphoric acid, 35·3; alumina, 49·15; water, 12·85, with some lime, iron, etc.

AUGER, n. *aw'gēr* [AS. *naƿ-gar*—from *naƿa*, the nave of a wheel; *gār*, a piercer: Fin. *napa*, a navel, the middle of a thing]: an iron tool for boring holes.

AUGEREAU, *ōzh-rō'*, PIERRE FRANÇOIS CHARLES, Duke of Castiglione, Marshal and Peer of France, one of the most brilliant and intrepid of that band of general officers whom Napoleon gathered around himself: 1757. Oct. 21—1816, June 11; son of a tradesman. At the age of seventeen, he enlisted in the French carabiniers; afterwards was in the Neapolitan service till 1787, when he settled in Naples as a fencing-master. With other French residents, he was banished from that city in 1792, and immediately volunteered into the French revolutionary army intended for the repulsion of the Spaniards. His services were so conspicuous, that in less than three years he was made general of a division. In 1795, he accompanied the army to Italy, where he greatly distinguished himself, especially in the field, but also in council. He gained much glory in the battles of Millesimo, Ceva, Lodi, Castiglione (for which he received his title), Roveredo, Bassano, etc. In 1797, he was appointed to command the Army of the Rhine; but a few months later he was transferred to be commander of the tenth division at Perpignan. This post he resigned in 1799, when he was elected as deputy in the council of the Five Hundred. In 1801, he received the command of the army in Holland; in 1804, he was made a marshal; in 1805, he commanded a division of the army which reduced the Vorarlberg; afterwards he was engaged at Wetzlar, Jena, Eylau; also in Italy (1809); Spain (1810); Berlin, Bavaria, and Saxony (1813).

AUGER-SHELL, n. *aw'gēr shēl*: the English name of the shells belonging to the genus *Terebra*. It is given in consequence of their being long and pointed.

AUGHT, or OUGHT, n. *awt* [AS. *ā-wiht*; Goth. *waihts*, a thing]: anything; a tittle or jot.

AUGIER—AUGITE.

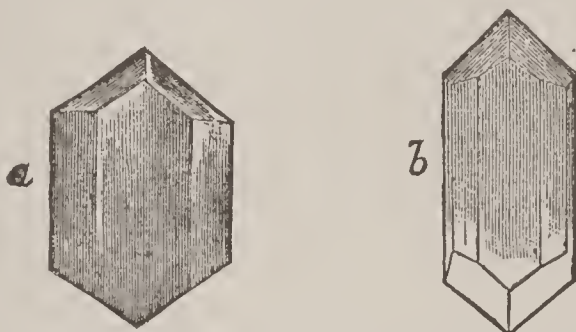
AUGIER, *ô'zhe-â'*, GUILLAUME VICTOR EMILE: French dramatist; b. Valence, 1820, Sept. 17; educated for the profession of an advocate, but soon turned to literature, especially the drama. In 1844, he composed a piece in two acts, and in verse, entitled *La Ciguë*, which he offered to the Théâtre Français, but without success. The Odéon, however, received it, and it was played at that theatre with considerable applause for nearly three months. This is said to be the best of A.'s works, containing moral lessons, set in a framework of the antique, and made attractive by elegant versification. In the following year, the Théâtre Français sought his services, and he produced for that theatre his second comedy, entitled *Un Homme de Bien*, in three acts, and in verse—a comedy of the day, only partially successful. A third, *L'Aventurière*, 1848, was better received, but was thought too full of common-place moralizing. *Gabrielle*, 1849, also highly moral, gained for its author the Monthyon prize. In 1852, he wrote *Diane*; in 1853, *La Pierre de Touche* (with Jules Sandeau); also *Philiberte*. After this time, his pieces belong to the comedy of intrigue. Such are *Le Mariage d'Olympe*; *Le Gendre de M. Poiriër*, written in partnership with Jules Sandeau; and *La Revanche de Georges Dandin*—all produced 1855; *La Jeunesse*, in 1858; *Les Lionnes Pauvres*, in the same year, written in conjunction with E. Foussier; and the *Beau Mariage*, also in conjunction with Foussier, in 1859. Either singly or with others, A. has also written *Les Effrontés*, *Le Fils de Giboyer*, *Maître Guérin*, *La Contagion*, *La Chasse au Roman*, *L'Habit Vert*, *Paul Forestier*, and *Sapho*—the last an opera, music by Gounod. In 1856, he published a small vol. of *Poésies*. Usually, A. is regarded as one of the leaders of the school of good sense; in his later pieces, however, approaching too much to the manner of the younger Dumas. In 1858, he was elected a member of the Académie Française, and was made a commander in the *Légion d'Honneur*. 1868. D. 1889, Oct. 25.

AUGITE, n. *aw'jīt* [Gr. *au'gē*, brightness]: aluminous var. of PYROXENE, a mineral very nearly allied to hornblende (q.v.), which has, indeed, by some mineralogists been regarded as a variety of it, though the distinction between them is important, as characterizing two distinct series of igneous rocks. **AUGITIC**, a. *aw-jīt'ik*, pertaining to.

Augite consists of 47–56 per cent. of silica, 20–25 per cent. of lime, and 12–19 per cent. of magnesia, the magnesia sometimes giving place in whole or in part to protoxide of iron, and the varieties containing 2–15 alumina; some have a little soda or potassa, etc. Its specific gravity is 2.935–3.434. It is little or not at all affected by acids. It is usually of a greenish color, often nearly black. It crystallizes in six or eight-sided prisms, variously modified; it often occurs in crystals, sometimes imbedded, often in grains or scales. It is an essential component of many igneous rocks, particularly of basalt (q.v.), dolerite, and A.-porphyry (see PORPHYRY), from which chiefly it derives its importance as a mineral species. Augite Rock, consisting essentially of A. alone, occurs in the Pyrenees. A. is a common mineral in

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trap-rocks. It is rarely associated with quartz, in which respect it differs from hornblende, but very often with labradorite, olivine, and leucite. Fluorine, generally present in small quantity in hornblende, has never been detected in A.



a, Common Augite; *b*, Green Augite.

The form of the crystals also is different in the two minerals, as well as their cleavage; but Prof. Gustav Rose of Berlin has endeavored to show that the difference between A. and hornblende arises only from the different circumstances in which crystallization has taken place, and that A. is the production of a comparatively rapid, and hornblende of a comparatively slow, cooling. He regards some of the varieties as intermediate. His views have been supported by experiments, and by a comparison of A. with certain crystalline substances among the scoriæ of foundries.—*Diopside*, *Sahlite*, and *Coccolite* are varieties of Pyroxene; also *Diallage* (q.v.), *Hedenbergite*, and other minerals.

AUGMENT, *v.* *awg-měnt'* [L. *augmen'tum*, an increase: F. *augmenter*, to increase—from L. *augēō*, I increase]: to increase; to make or become large in size or extent. **AUGMENT**, *n.* *awg'měnt*, an increase; a prefix. **AUGMENT'ING**, *imp.* **AUGMENT'ED**, *pp.* **AUGMENTABLE**, *a.* *awg-měnt'ă-bl*, that may be increased. **AUG'MENTA'TION**, *n.* *-tă'shŭn*, an increase; the act of enlarging. **AUGMEN'TATIVE**, *a.* *-tă-tiv*, having the power to augment: *N.* in *gram.*, opposite of diminutive. **AUGMEN'TER**, *n.* one who.—**SYN.** of 'augment, *n.*': increase; accession; augmentation; addition.

AUGMENTA'TION, in Heraldry: see **HERALDRY**.

AUGMENTA'TION, in Music: reproduction of a melody, or principal subject of a composition in the course of the progress of the piece, in notes of greater length than those notes in which the melody is first introduced. The tempo remains unaltered. A. is of great importance in the treatment of the subjects, or themes, for fugues, and properly used produces great effects.

AUGMENTA'TION, **PROCESS OF**, in Scotch Law: an action in the Court of Teinds (q.v.) by the minister of a parish against the titular, or beneficiary, and heritors, for the purpose of procuring an increase to his stipend.

AUGMENTA'TION COURT: court erected by King Henry VIII. for the increase of the revenues of his crown, by the suppression of monasteries.

AUGSBURG, *awgs'börg*: historically one of the most notable cities in Germany; in the angle between the rivers

AUGSBURG CONFESSION.

Wertach and Lech; chief city of the circle of Swabia and Neuburg, in Bavaria. Though of an antique and rather deserted appearance, A. has numerous fine buildings, and especially one noble street, the 'imperial' Maximilian Strasse, adorned with bronze fountains. The industry of A. is reviving; several cotton and woolen factories are in operation, as well as manufactories of paper, tobacco, and machinery. Its gold and silver wares retain their ancient reputation. The art of copper engraving is extinct; but printing, lithography, and bookselling have taken a new start. The *Allgemeine Zeitung*, the best known of the German newspapers, was published here till 1882 (now at Munich). There are in A. ten printing establishments, many bookshops, and more breweries. Banking and stock-jobbing are extensively carried on; and it is still the emporium of the trade with Italy and s. Germany. It is the centre of a system of railways connecting it with Nürnberg and Leipsic, with Switzerland, Munich, etc. The foundation of A. was the 'colony' planted by the emperor Augustus, B.C. 12, after the conquest of the *Vindeli*, probably on the site of a former residence of that people. It was called *Augusta Vindelicorum*, whence the present name. It became the cap. of the province of Rhætia, was laid waste by the Huns in the 5th c., and came next under the dominion of the Frankish kings. In the war of Charlemagne with Thassilo of Bavaria it was again destroyed. After the division of Charlemagne's empire, it came under the Duke of Swabia; but, enriched by commerce, was able to purchase gradually many privileges, and became, 1276, a free city of the empire. It reached the summit of its prosperity by the end of the 14th c. About 1368 its aristocratic government was set aside for a democratic, which lasted for 170 years, till the aristocracy, favored by Charles V., regained the ascendancy. A. continued in great eminence for its commerce, manufactures, and art, till the war between Charles V. and the Protestant League of Schmalkald (1540). With Nürnberg, it formed the emporium of the trade between n. Europe and the south, and its merchants were princes whose ships were in all seas. See FUGGER. It was also the centre of German art, as represented by the Holbeins, Burkair, Altdorfer, and others. Many diets of the empire were held in A., and the leading events of the Reformation are associated with its name. The discovery of the road to India by the Cape, and of America, turned the commerce of the world into new channels, and dried up the sources of A.'s prosperity. It lost its freedom with the abolition of the German empire in 1806, and was taken possession of by Bavaria. Pop. (1880) 61,408; (1900) 89,109.

AUGSBURG CONFESSION: the chief standard of faith in the Lutheran Church. Its history is the following: With a view to an amicable arrangement of the religious split that had existed in Germany since 1517, Charles V., as protector of the church, had convoked a diet of the empire, to meet at Augsburg, 1530, April 8, and had required from the Protestants a short statement of the

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doctrines in which they departed from the Rom. Cath. Church. The Elector John of Saxony, therefore, in March, called on his Wittenberg theologians, with Luther at their head, to draw up articles of faith, to lay before him at Torgau. The commissioned doctors took as a basis, as far as pure doctrine was concerned, articles that had been agreed to the previous year at conferences held at Marburg and Schwabach, in the form of resolutions of the Lutheran reformers of Germany against the doctrines of Zwingli. These doctrinal articles with a supplement, and with a practical part added, were laid before the elector at Torgau. Melanchthon then, taking the Torgau articles as a foundation, with the advice of various Protestant theologians, as well as princes and other secular authorities, composed the document, which he first called an Apology, but which in the diet itself took the name of the Augsburg Confession. This work was begun at Augsburg in May. Luther was not present in Augsburg, being then under the ban of the empire, but his advice was had recourse to in its composition. The Torgau articles were in German; the Confession was both in German and Latin; and Melanchthon labored incessantly at its improvement till it was presented to the emperor, June 25. The character of Melanchthon, in the absence of Luther, had led him, in setting about the composition of the document, to aim at maintaining a spirit of love, forbearance, and mediation, as well as the utmost brevity and simplicity. Its object, which became gradually apparent only after the meeting of the diet, was, in the first place, to give a collected view of the belief of the Lutheran Protestants, aiming at the same time at refuting the calumnies of the Rom. Catholics, and at laying a foundation for measures of reconciliation.

The first part of the Confession contains 21 articles of faith and doctrine: 1. Of God; 2. Of Original Sin; 3. Of the Son of God; 4. Of Justification; 5. Of Preaching; 6. Of New Obedience; 7 and 8. Of the Church; 9. Of Baptism; 10. Of the Lord's Supper; 11. Of Confession; 12. Of Penance; 13. Of the Use of Sacraments; 14. Of Church Government; 15. Of Church Order; 16. Of Secular Government; 17. Of Christ's Second Coming to Judgment; 18. Of Free Will; 19. Of the Cause of Sin; 20. Of Faith and Good Works; 21. Of the Worship of Saints. The second and more practical part, with discussion at greater length, contains seven articles on disputed points: 22. On the Two Kinds of the Sacrament; 23. Of the Marriage of Priests; 24. Of the Mass; 25. Of Confession; 26. Of Distinctions of Meat; 27. Of Conventual Vows; 28. Of the Authority of Bishops.

This document, signed by some six Protestant princes and two free cities, was read before the emperor and the diet, 1530, June 25. Melanchthon, not looking upon the Confession as binding, began soon afterwards to make some alterations in its expression; at last, in 1540, he published a Latin Edition (*Confessio Variata*) in which there were important changes and additions. This was especially the case with the article on the Lord's Supper, in which, with a view

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to conciliation, he endeavored to unite the views of the Lutherans and Calvinists. This gave rise to much controversy; orthodox Lutheranism repudiated the alterations of Melancthon, and long continued to subject his memory to great abuse; though it is clear that Melancthon and his adherents contemplated no substantial departure in doctrine from the original Confession. It is not certain that the form of the Confession found in the Lutheran standards is identical with the unaltered Augsburg Confession, as the two original documents—German and Latin—laid before the diet have been lost. The chief distinction between the orthodox Lutherans and the reformed churches of Germany has all along been adherence to the ‘unaltered’ or to the ‘altered’ Confession. It was even a matter of controversy whether the ‘reformed’ were entitled to the rights secured to the Protestants by the Religious Peace of Augsburg, concluded 1555, on the ground of the ‘unaltered’ Confession.—Though the Augsburg Confession is still formally adhered to by the Protestant churches of Germany, it is confessedly no longer the expression of the belief of the vast majority of the members, after the great advances made by theology, and the many alterations in public opinion and feeling.

AUGS'BURG INTERIM : see INTERIM.

AUGUR, *n.* *aw'gēr* [*L. augur*, an augur—probably from *avis*, a bird; and *gur*, telling—from *garrō*, I talk idly]: among the anc. Romans, one who professed to tell future events by natural tokens, as the singing and flying of birds, and the flashing of lightning; a soothsayer: *V.* to profess to foretell events; to guess; to be a sign. AU'GURING, *imp.*: *ADJ.* engaged on conjectures; foreboding: *N.* the imaginary interpretations of signs. AUGURED, *pp.* *aw'gērd*. AU'GURSHIP, *n.* the office or dignity. AUGURAL, *a.* *aw'-gū-rāl*, or AUGU'RIAL, *-rī-āl*, pertaining to. AUGUROS, *a.* *aw'gū-rūs*, foreboding; predicting. AUGURATE, *v.* *aw'gū-rāt*, to predict. AU'GURA'TING, *imp.* AU'GURA'TED, *pp.* AU'GURY, *n.* *aw'gū-rī*, or AUGURATION, *n.* *aw-gūr-ā'shūn*, the art of foretelling events by the flights of birds; an omen or prediction. AUGURIST, *n.* *aw'gūr-īst*, one who practices augury; an augur.—*SYN.* of ‘augur, *v.*’: to presage; forebode; betoken; prognosticate; portend; predict.

AU'GURIES and AU'SPICES : omens of future events. The entire religious and political life of the early Romans was deeply penetrated by the influence of their superstitions, among which auguries and auspices held a prominent place.

Like almost all primitive nations, the Romans believed that every unusual occurrence had a supernatural significance, and contained, hidden in it, the will of Heaven regarding men. To reveal or interpret this hidden will was the exclusive privilege of the augur, who apparently derived his official designation, in part at least, from *avis*, a bird; while Roman history abundantly proves that the observation of the flight of birds was the principal means adopted for discovering the purpose of the gods. It was not, however, any one who could be appointed an augur. The gods selected their own interpreters—that is to say,

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they conferred the divine gift upon them from their very birth; but an educational discipline also was considered necessary; hence a 'college of augurs' figures in the very dawn of Roman history. Romulus, it is almost certain, was an augur. He is said to have been skilled in the art of divination from his youth; and by 'divination' we must specially understand augury; for the Romans, with patriotic piety, held all the forms of divination practiced in other countries to be useless and profane. Previous to the Ogulnian law, passed B.C. 307, there were only four augurs, selected from the patricians. By this law, however, the plebeians became eligible for the pontifical or augural offices, and five were immediately created. For more than two hundred years, the number continued the same, till Sulla, B.C. 81, increased it to fifteen. Finally, in the first days of the empire, when all parties, tired of the long civil wars, hurried to throw their privileges at the feet of the monarch who had brought peace into their homes, the right of electing augurs at his pleasure was conferred on Augustus, after which the number became indefinite.

At first, the augurs were elected by the *Comitia Curiata*; but as the sanction of the former was necessary to give validity to the acts of the latter, they could always 'veto' any elections which were obnoxious to them; so that the power of electing members to fill up vacancies naturally fell into the hands of the college itself, and so continued till B.C. 103, when a tribune of the people named Ahenobarbus carried a law by which it was enacted that for the future vacancies in the augural and pontifical offices should be filled not by those religious corporations themselves, but by a majority of certain picked tribes. This new law was occasionally repealed and re enacted during the civil wars which lasted till the time of Augustus. The scramble for power, however, during these political vicissitudes, as well as the general advance of knowledge, had rendered its prophetic pretensions ridiculous in the eyes of educated people. By Cicero's time, it had lost its religious character altogether, but was still regarded as one of the highest political dignities, and coveted for the power it conferred.

The modes of divination employed by the augurs were five in number—*augurium ex cælo, ex avibus, ex tripudiis, ex quadrupedibus, ex diris*. The *first*, relating to the interpretation of the celestial phenomena, such as thunder and lightning, was apparently of Etruscan origin, and held to be of supreme significance. The *second* related to the interpretation of the noise and flight of birds. Not every bird, however, could be a sure messenger of the gods. Generally speaking, those 'consulted,' as it was called, were the eagle, vulture, crow, raven, owl, and hen. The first two belonged to the class of *alites*, or birds whose *flight* revealed the will of the gods; the last four to the class of *oscines*, whose voice divulged the same. These two modes of augury were the oldest and most important. Of the other three, the auguries *ex tripudiis* were taken from the feeding of chickens; the auguries *ex quadrupedibus*, from four-footed animals—as, for instance, if a dog, or wolf, or hare, ran across the path

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of a Roman, and startled him by any unusual motion, he mentioned it to an augur, who was expected to be able to advise him what to do; the auguries *ex diris* (a vague kind of augury), from any trivial accidents or occurrences not included in the previous four—such as sneezing, stumbling, spilling salt on the table, etc.

At Rome, the auspices were taken on the summit of the Capitoline Hill; and the ground on which the augur stood was solemnly set apart for the purpose. The latter then took a wand, and marked out a portion of the heavens in which his observations were to be made. This imaginary portion was called a *templum* (hence *contemplari*, to contemplate), and was subdivided into right and left. According as the birds appeared in either of these divisions were the auspices favorable or unfavorable. How vast were the political influence and authority of the augurs is seen from the fact, that almost nothing of any consequence could take place without their sanction and approval. The election of every important ruler, king, consul, dictator, or pretor, every civic officer, every religious functionary, was invalid if the auspices were unfavorable. No general could lawfully engage in battle—no public land could be allotted—no marriage or adoption, at least among the patricians, was held valid—unless the auspices were first taken, while the Comitia of the Centuries could be dispersed at a moment's notice by the veto of any member of the augural college.

The two terms, auguries and auspices are generally used as synonymous. But a slight difference is perceptible; not the augurs only, but the chief magistrates of Rome (inheriting the honor from Romulus), held the 'auspices,' while the 'auguries' were exclusively in possession of the augurs; but the mode of divination, and the end to be obtained by it, seem to have been the same in both cases.

The power of taking the auspices in war was confined to the commander-in-chief; and any victory gained by a legate was said to be won under the auspices of his superior, and the latter alone was entitled to a triumph. Hence has originated the very common phrase 'under the auspices' of some one, which usually denotes nothing more than that the person alluded to merely lends the influence of his name.

AUGUST, a. *aw-gŭst'* [L. *augustus*, sacred, majestic: It. *augusto*; F. *auguste*]: majestic; grand; inspiring awe. AUGUST'NESS, n. dignity of appearance; grandeur in mien. AUGUST'LY, ad. *-lŭ*.—SYN. of 'august': grand; great; sublime; noble; majestic; imposing; magnificent; stately; splendid; superb; solemn; awful.

AUGUST, n. *aw'gŭst*: sixth month in the Roman year, which began with March; it was originally styled *Sextilis*, and received its present name from the emperor Augustus on account of several of the most fortunate events of his life having occurred during this month. On this month he was first admitted to the consulate, and thrice entered the city in triumph. On the same month, the legions from the Janiculum placed themselves under his auspices, Egypt was brought under the authority of the Roman

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people, and an end put to the civil wars. (See Macrobius, i. 12.) As the fifth month, or *Quintilis*, had previously been styled Julius in honor of Julius Cæsar, a day was taken from February to make A. equal with July.—AUGUSTAN, a. *aw-gŭs'tān*, pertaining to Augustus or his age; literary or refined.

AUGUSTA, *aw-gŭs'ta*: capital of Richmond co., Ga., at the head of navigation on the Savannah river, 132 m. n.w. of Savannah; the third city in Georgia in wealth and population. It was laid out in 1735, being named after the Princess Augusta, the favorite daughter of George II. The city is situated on a beautiful plain, with wide, straight streets, one of which, Green street, is 168 ft. broad, and beautifully shaded. The houses are large, and surrounded by gardens. The facilities for commerce and transportation include the Savannah river and six lines of railway, A. being the eastern terminus of the Georgia railroad system. The river supplies a magnificent water-power, extensively used in manufacturing, through a canal, completed 1846, and greatly enlarged 1872. The city owns the water-works (value \$500,000) and the canal (value \$1,500,000), and 1892 had a revenue of \$90,000 from them. According to the census of 1900 the city had 388 manufacturing establishments with \$9,016,619 capital and 7,138 hands, which paid \$1,815,879 for wages and \$6,244,286 for materials, and received \$10,069,750 for products. The great Sibley mill, erected on the site of a powder manufactory used during the war, contains 35,176 spindles, and 844 looms. The average yearly cotton receipts of A. are 150,000 bales. The city's trade amounts to \$55,000,000 per annum. Its banking business is the largest of any city in the south, comprising 10 banks with an annual business of \$200,000,000; the foreign exchange of the city amounting to \$17,000,000 per annum. The principal buildings are the City Hall, Masonic Hall, Odd-Fellows' Hall, and Orphan Asylum. There are 3 daily, 5 weekly, and 3 monthly periodicals, 21 churches, a U. S. arsenal, and several hospitals. There is a high school for young women, and one for colored pupils for both sexes. The grammar, intermediate, and primary schools number 15, for white and colored children. The Medical College of Georgia is located here. Among the private institutions of learning are the Houghton Institute, founded by private bequest in 1852, and accommodating 500 pupils; the St. Mary's Academy, the Sacred Heart Academy, Commercial College, and the Telfair private school.

The South Carolina railway connecting A. with Charleston, S. C., was the first steam railway built in the United States, incorporated in 1827, and first used in 1831. The Georgia railroad was chartered in 1833, and completed to Atlanta 10 years later. The headquarters of this road are in A., with machine and repair shops employing 200 hands.

There are also the Central railroad of Georgia, the Port Royal and Augusta railroad, the Charlotte Columbia and Augusta railroad, the Columbia Wilmington and Augusta railroad, and the Augusta and Knoxville railroad recently completed. The city has an inexhaustible water system,

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supplied from the canal; a perfect system of sewage, and a model fire department. In 1891 the valuations were: real \$16,041,973, personal \$5,309,326, total \$21,351,299; 1901, total \$19,367,622; and debt 1902, all bonded, \$1,748,000. Pop. (1890) 33,300; (1900) 39,441.

AUGUSTA: a town, cap. of Maine; on both banks of the river Kennebec, here crossed by a bridge 520 ft. long; lat. 44° 19' n., long. 69° 50' w. Up to A. the river is navigable for sloops from its mouth, 43 m. in a straight line; while a dam immediately above the city enables steamboats to ply more than 20 m. above, as far as Waterville. A. is on the railway between Portland and Bangor. The dam has created a vast water-power, used for manufacturing. Pop. (1890) 10,521; (1900) 11,683.

AUGUSTA, MARIA LOUISA CATHERINE, Queen of Prussia, Empress of Germany: b. 1811, Sep. 3; daughter of Charles Frederic, Grand Duke of Saxe Weimar, her mother being a daughter of Paul I. of Russia. The princess having been educated at the court of her grandfather, Charles Augustus, Grand Duke of Saxe Weimar, intimate friend of Goethe, Wieland, and other men of letters resident at Weimar, made their acquaintance, and was on familiar terms in particular with the great German poet, Goethe. Augusta married William, Prince of Prussia, 1829, June 11, and by this marriage became afterwards the queen of Prussia, and, in 1871, empress of Germany. The empress has had but two children, the crown prince of Germany, who married the princess royal of England, and the princess Louisa. She is highly esteemed for benevolence, and respected as a patron of the arts and literature. During the Franco-Prussian war her exertions were unremitting in behalf of wounded soldiers. In 1872, she founded a seminary for the education of daughters of officers slain in the war. D. 1890.

AUGUSTENBURG, *ow'gôs-tên-berg'*: little village in the centre of the island of Alsen; noted as the residence of the Duke of Holstein-Sonderburg-Augustenburg, also for its splendid 'stables,' and for the castle belonging to the ducal family. Pop. 800.

AUGUSTI, *ow-goos'tē*: German theologian; 1772-1841, Apr. 28; b. at Eschenberga, near Gotha. He studied at Jena under the celebrated Griesbach. In 1798, he became lecturer in philosophy, and in 1800, prof. extraordinary of the same. Three years later he succeeded Ilgen in the chair of Oriental Literature; but his love of theological studies led him to accept a theological professorship in the Univ. of Breslau. In 1819, he was transferred to Bonn, and made a director of the consistory at Cologne. In his early career, A. was a rationalist; subsequently he returned to orthodox Lutheranism, but was, to the last, free from bigotry. Of his writings, the most important is his *Manual of Christian Archaeology* (Leip. 1836-7).

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AUGUSTINE, *av'gūs-tīn*, AURELIUS, ST.: greatest of the Latin fathers of the church; 354, Nov. 13—430, Aug. 28; b. Tagaste, a town of Numidia. His father, Patricius, who was poor, but of good family, and a magistrate, continued a pagan till advanced in years, and was baptized only shortly before his death. Patricius does not seem to have been remarkable for elevation of mind; on the contrary, one may fairly conclude; from his son's statements, that he was an irascible, kind-hearted man, intent on his son's advancement in this world more than in that which is to come. His temper often caused great sorrow to his gentle and pious wife, who loved him faithfully, however, and was therefore rewarded with the secret by which she could charm the evil spirit out of him. Patricius was very anxious that A. should become a fine scholar, as he noticed that not a few people in his day were obtaining large incomes by their 'wits.' A. was accordingly sent to school at Madaura and at Carthage. Before this he had enjoyed the inestimable felicity of a religious education at home. His mother, Monica, had been his best instructor. Neander truly says: 'Whatever treasures of virtue and worth the life of faith, even of a soul not trained by scientific culture, can bestow, were set before him in the example of his pious mother.'

The energy and penetration of intellect exhibited by the young A. excited the most flattering hopes. When he left home for Carthage, a joyous, ardent, and resolute student, a bright career of worldly prosperity seemed to open before him. But strong as A. was, the temptations of Carthage were stronger. His nature, deep, impetuous, passionate, thirsted for excitement. He had just reached the age when happiness is conceived to be synonymous with pleasure, and Carthage, the second city of the empire, was rank as Rome in its sensual corruptions. A. fell. In his *Confessions*, he paints the frightful abyss into which he felt himself plunged; nor does he seek to excuse himself; on the contrary, the shadow of his guilt is thrown forward over all his boyish life, and he displays even a morbid zeal and acuteness in pointing out what others, less censorious, might term the frivolous errors of his childhood, but which seemed to A. the parents of his subsequent vices, and therefore equally bad and equally reprehensible. Before he had reached his eighteenth year his mistress bore him a son, who was named Adeodatus—afterwards baptized along with him at Milan. The thing which appears to have first stirred his deeper being into life was a passage which he suddenly came across in the *Hortensius* of Cicero, treating of the worth and dignity of philosophy. To use the language of Neander: 'The conflict now began in his soul which lasted through eleven years of his life. As the simplicity of the sacred Scriptures possessed no attractions for his taste—a taste formed by rhetorical studies and the artificial discipline of the declamatory schools—especially as his mind was now in the same tone and direction with that of the emperor Julian, when the latter was conducted to the Platonic

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theosophy; as, moreover, he found so many things in the doctrines of the church which, from want of inward experience, could not be otherwise than unintelligible to him, while he attempted to grasp, by the understanding from without, what can be understood only from the inner life, from the feeling of inward wants, and one's own inward experiences; so, under these circumstances, the delusive pretensions of the Manichæan sect, which, instead of a blind belief on authority, held out the promise of clear knowledge and a satisfactory solution of all questions relating to things human and divine, presented the stronger attractions to his inexperienced youth.' A. now became a professed Manichæan. Returning to his native town, he lectured for a short time on 'grammar'—that is to say, on literature. Soon afterwards, he returned to Carthage, to pursue his profession under more favorable auspices. Here he wrote, in his twenty-seventh year, his first work, *De Apto et Pulchro*—a treatise on æsthetics, unfortunately lost. About the same time his spiritual nature became keener and more imperative in its demands. The futile speculations of the visionary sect to which he had attached himself now became apparent. He had a series of interviews and conversations with Faustus, one of the most celebrated teachers of Manichæism; and these so utterly disappointed his expectations, that he left the society in disgust and sad bewilderment, after having wasted ten years in a fruitless search for wisdom and truth.

In 383, he went to Rome, followed by the tears, the prayers, and the anxieties of his excellent mother, who was not, however, bereaved of hope, for both her faith and her love were strong. After a short stay, A. left Rome, and proceeded to Milan, where he became a teacher of rhetoric. No change could have been more fortunate. At this time the bishop of Milan was the eloquent and devout St. Ambrose. An intimacy sprung up between the two. A. often went to hear his friend preach. He was not, however, as yet a Christian. He had only emerged, as it were, from Manichæanism—the region of night-clouds and shadows—and was gazing on the gray dawn of the Platonic philosophy, prophetic of the noon-tide splendors of Christianity soon to burst upon his vision. Still, A. did not afterwards despise this preliminary training; he was too great and honest a man for that. He confesses that the Platonic writings 'enkindled in his mind an incredible ardor;' they awakened his deeper spiritual nature, which keenly upbraided him with his sins. Once more he studied the Bible, though from a purely Platonic point of view, and rather wishing to find in it 'those truths which he had already made himself acquainted with from the Platonic philosophy, but presented in a different form.' He began to think that Christ and Paul, by their glorious life and death, their divine morality, their great holiness, and manifold virtues, must have enjoyed much of that 'highest wisdom' which the philosophers thought confined to themselves. For some time he clung to his Platonic Christianity, and shaped the doctrines of the

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Bible according to it; but when he found that it was weak to overcome temptations, and that 'he himself was continually borne down by the ungodly impulses which he thought he had already subdued,' the necessity of a living personal God and Saviour to rescue him from the condemnation of his own conscience, and impart a sanctifying vitality to the abstract truths which he worshipped, shone clear through all the stormy struggles of his heart. In the eighth and ninth books of his *Confessions*, he has left a noble though painful picture of his inward life during this momentous crisis. It is sufficient to say that the Spirit of God triumphed. A., with his natural son, Adeodatus, of whom he seems to have been justly fond, was baptized by Ambrose at Milan, 387, April 25. Shortly afterwards he set out on his return home. At Ostia, on the Tiber, his beloved mother, who had followed him to Milan, died; her eyes had seen the salvation of her son, and she could depart in peace. After her death, and before leaving Italy for Africa, A. wrote his treatises, *De Moribus Ecclesiæ Catholicæ et de Moribus Manichæorum*; *De Quantitate Animæ*; and *De Libero Arbitrio*. It is unnecessary to relate at any length the subsequent life of Augustine. His character, and principles of action had become fixed, and he now brought the whole majesty of his intellect to bear upon the side of Christianity. Having, as was then customary for converts, divided his goods among the poor, he retired into private life, and composed several treatises—*De Genesi Contra Manichæos*, *De Musicâ*, *De Magistro*, and *De Verâ Religione*, which secured him high reputation. In 391, he was ordained a priest by Valerius, Bishop of Hippo; and during the next four years, though earnestly engaged in the work of preaching, contrived to write three different works. In 395, he was made colleague of Valerius. Then ensued a period of hot strife, known in church history as the Donatist and Pelagian controversies. A., having passed through so fierce a fire of personal experience on religious questions, was very jealous both of what he *knew* to be the truth, and of what he only *thought* to be the truth. This, added to his acute and profound intellect, made him, in spite of the lack of historical erudition, a most formidable and relentless antagonist. For this portion of his career see PELAGIUS: PELAGIANISM. In 397, appeared his *Confessiones*, in 13 books—a deep, earnest, and sacred autobiography of one of the greatest intellects the world has seen. Passages of it have no parallel except in the Psalms of David. In 413, he commenced his *De Civitate Dei*, and finished it 426. It is generally considered his most powerful work. Exception may be taken to much that it contains. The learning is no doubt considerable, but it is not accurate. A. was an indifferent scholar; he had studied the Latin authors well; but of Greek 'he knew little, and of Hebrew, nothing.' Many of his reasonings are based on false and untenable premises, and he erred often in his etymological explanations; but in spite of these and other drawbacks, the final impression left on the mind is, that the work is one of the

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most profound and lasting monuments of human genius. In 428, A. published his *Retractationes* in which he makes a recension of all his previous writings. It is a work of great candor. He frankly acknowledges such errors and mistakes as he had discovered himself to have committed, explains and modifies numerous statements, and modestly reviews his whole opinions. His end was now drawing nigh. In 429, the Vandals, under the barbarian Genseric, landed in Africa; next year they besieged Hippo. A., now in his seventy-sixth year, prayed that God would help his unhappy church, and grant himself a release out of this present evil world. He died in the third month of the siege.

No mind has exerted greater influence on the church than that of Augustine. Consistency of theological opinion is not to be looked for from him, nor from any of the church fathers. A larger sphere of freedom was permitted to religious speculation in those unfettered days, before creeds were encircled with that traditionary sanctity that they now possess. Nevertheless, there is little difficulty in determining the central tenets of his theological belief. He held the corruption of human nature through the fall of man, and the consequent slavery of the human will. Both on metaphysical and religious grounds, he asserted the doctrine of predestination, from which he necessarily deduced the corollary doctrines of election and reprobation; and finally, he strenuously supported, against the Pelagians, not only these opinions, but also the doctrine of the perseverance of the saints. At the same time, it is but fair to add that, even on such points, his language is far from uniform; that much of the severity of his doctrines arose from the bitter and painful remembrance of his own early sins, and from the profound impression which the corrupt state of society in his time, and the vast desolations of barbarism, had made on his earnest and susceptible soul; and that, in his desire to give glory to God, he sometimes forgot to be kind or even just to man. In illustration of this may be mentioned the fact (see Neander, Mosheim, and Waddington's Church Histories), that the maxim which justified the chastisement of religious errors by civil penalties, even to burning, was established and confirmed by the authority of A., and thus transmitted to following ages. In his epistle to Dulcitius, a civil magistrate who shrank from putting in force the edict of Honorius against heretics, he uses these words: 'It is much better that some should perish by their own fires, than that the whole body should burn in the everlasting flames of Gehenna, through the desert of their impious dissension.' In the opinion of Neander, it was to the somewhat narrow culture, and the peculiar personal experience and temperament of Augustine, that the doctrines of absolute predestination and irresistible grace, first systematized by him, owed much of that harshness and one-sidedness which so long obstructed their general reception by the church, and which continue to render them repulsive to multitudes.

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His life has been written by Tillemont, and his entire works have been repeatedly edited. The Benedictine edition (Paris, 11 vols., 1679-1700) is the best. Numerous editions of the *Confessiones* and *De Civitate Dei* have appeared; the most recent of the latter by Marcus Dods, D.D. In the 'Library of Fathers of the Holy Catholic Church,' are translations into English of A.'s *Confessions*, *Exposition on St. John's Gospel* and *on the Psalms*, *Sermons on the New Testament*, and *Short Treatises*. His *Sermon on the Mount* is translated by Trench, and his *Letters* by Rev. J. G. Cunningham.

AUGUSTINE, St., first Abp. of Canterbury: d. 604: was originally a monk in the convent of St. Andrew at Rome. In 596 he was sent, with forty other monks, by Pope Gregory I., to convert the Anglo-Saxons to Christianity, and establish the authority of the Roman see in Britain. The missionaries were kindly received by Ethelbert, King of Kent, whose wife Bertha, daughter of the king of the Parisians, was a Christian, and retained a Frankish bishop in her suite as chaplain. A residence was assigned to them at Canterbury, then called *Durovernum*, where they devoted themselves to monastic exercises and preaching. The conversion and baptism of the king contributed greatly to the success of their efforts among his subjects, and it is recorded that in one day A. baptized 10,000 persons in the river Swale. Nominal as much of this conversion must have been, there is abundant testimony to the fact that a marked improvement in the life and manners of the Anglo-Saxons followed the evangelistic labors of A. and his companions.

In 597, he went to Arles, by direction of the pope, and was there consecrated Abp. of Canterbury and Metropolitan of England. On his return, he despatched a presbyter and monk to Rome, to inform the pope of his success, and obtain instruction on certain questions; Gregory's advice with regard to the propagation of the faith are admirable examples of that pious ingenuity which has often characterized the missionary policy of the Church of Rome. Thus, instead of destroying the heathen temples, A. was recommended to convert them into Christian churches, by washing the walls with holy water, erecting altars, and substituting holy relics and symbols for the images of the heathen gods. A.'s subsequent efforts to establish his authority over the native British church were not so successful as his missionary labors. He was buried in the churchyard of the monastery bearing his name, founded by King Ethelbert. His body was removed to the cathedral of Canterbury, 1091. Bebe's *Historia Ecclesiastica Gentis Anglorum* is the great authority for the life of St. Augustine. A thoughtful and pleasing sketch of it is in the Rev. Arthur P. Stanley's *Historical Memorials of Canterbury*, Lond. 1855.

The site and remains of St. A.'s monastery were purchased, 1844, by Mr. Beresford Hope, by whom they were presented to the Abp. of Canterbury in trust, for the erection of a missionary college in connection with the

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Church of England. This institution was incorporated by royal charter, 1848. The buildings, in which as much of the ancient structure as possible has been preserved, have accommodation for about 45 students, whose course of study extends over three years. Twenty exhibitions have been founded in connection with the college.

AUGUSTINS, n. plu. *aw-gŭs'tĭnz*, or AUGUSTINES: monks who follow the doctrines and rules of St. Augustine. AUGUSTINIAN, n. *aw'gŭs-tĭn'ĭ-ăn*, one of an order of monks so named; one who holds with St. Augustine that grace is absolutely effectual from its inherent nature.

AUGUSTINS, or AUGUSTINES, or AUGUSTINIANS: names of several religious bodies in the Rom. Cath. Church. Whether St. Augustine ever framed any formal rule of monastic life, is uncertain; but one was deduced from his writings, and was adopted by as many as thirty monastic fraternities, of which the chief were the Canons Regular, the Knights Templars (q.v.), the Begging Hermits, the Friars Preachers or Dominicans (q.v.), and the Premonstratensians (q.v.). The CANONS REGULAR OF ST. AUGUSTINE, or AUSTIN CANONS, appear to have been founded or remodelled about the middle of the 11th c. Their discipline was less severe than that of monks properly so-called, but more rigid than that of the secular or parochial clergy. They lived under one roof, having a common dormitory and refectory. Their habit was a long cassock, with a white rochet over it, all covered by a black cloak or hood, whence they were often called Black Canons. In England, where they were established early in the 12th c., they had about 170 houses, the earliest, it would seem, being at Nostell, near Pontefract, Yorkshire. In Scotland, they had about 25 houses: the earliest at Scone was founded 1114, and filled by canons from Nostell; the others of most note were at Inchcolm in the Firth of Forth, St. Andrews, Holyrood, Cambuskenneth, and Inchaffray.

The BEGGING HERMITS, HERMITS OF ST. AUGUSTINE or AUSTIN FRIARS, were a much more austere order, renouncing all property, and vowing to live by the voluntary alms of the faithful. They are believed to have sprung from certain societies of recluses who, in the 11th and 12th c., existed especially in Italy without any regulative constitution. At the instigation, as is alleged, of the rival fraternities of Dominicans and Franciscans, Pope Innocent IV., about the middle of the 13th c., imposed on them the rule of St. Augustine, whom they claimed as their founder. In 1256, Pope Alexander IV. placed them under the control of a superior or president called a 'general.' In 1287, a code of rules or constitutions was compiled, by which the order long continued to be governed. About 1570, Friar Thomas of Jesus, a Portuguese brother of the order, introduced a more austere rule, the disciples of which were forbidden to wear shoes, whence they were called *discalceati* or 'barefooted friars.'

The degeneracy of the order in the 14th c. called into

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existence new or reformed Augustinian societies, among which was that Saxon one to which Luther belonged. But in his day even these had fallen victims to the general corruption of the priesthood, and he inflicted serious injury upon it by his unsparing denunciations. After the French Revolution, the order was wholly suppressed in France, Spain, and Portugal, and partly in Italy and s. Germany. It was diminished even in Austria and Naples. It is most powerful in Sardinia and America.

The name of AUGUSTINES was given also to an order of nuns who claimed descent from a convent founded by St. Augustine at Hippo, and of which his sister was the first abbess. They were vowed to the care of the sick and the service of hospitals. The Hôtel-Dieu at Paris is still served by them.

AUGUSTOWO, *ow-gôs-tō'vō*: town of Poland, cap. of a circle of the same name: on the Netta, a feeder of the Bug; 138 m. n.e. from Warsaw. It was founded by Sigismund Augustus, King of Poland, 1557. It has woolen and linen manufactures, and some trade in horses and cattle. Great part of the surrounding districts is occupied by lakes and marshes, or covered with forests. Pop. 12,000.

AUGUSTULUS, *aw-gŭs'tŭ-lŭs*, ROMULUS: the last emperor of the western portion of the Roman empire. His name was Augustus, but the diminutive title under which he is universally known was given him by the Romans on account of the essential littleness of his character. He was the son of Orestes, a Pannonian of birth and wealth, who rose to high rank under the emperor Julius Nepos, whose favor he repaid by stirring up the barbarian troops in the pay of Rome to mutiny against him. On the flight of the emperor, Orestes conferred the vacant throne on his son A. (476), retaining all substantial power in his own hands. Orestes failing to conciliate the barbarians, who had helped him against Nepos, with a grant of the third of the lands of Italy, they, under the command of Odoacer, besieged him in Pavia, and capturing, put him to death. A. yielded at once, and being of too little consequence to be put to death, he was dismissed to a villa near Naples with an annual pension of 6,000 pieces of gold.

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AUGUSTUS, *aw-gŭs'tŭs*, CAIUS JULIUS CÆSAR OCTAVIANUS: B.C. 63, Sep. 23—A.D. 14, Aug. 19; son of Octavius and Atia (dau. of Julia, younger sister of Julius Cæsar). The Octavian family came originally from Velitræ, in the country of the Volsci; and the branch from which A. descended was rich and honorable. His father had risen to the rank of senator and pretor, but died in the prime of life, when A. was only four years old. A. was carefully educated in Rome under the guardianship of his mother and his step-father, Lucius Marcius Philippus. At the age of 12, A. delivered a funeral oration over his grandmother; at 16, he received the toga virilis. The talents of the youth recommended him to his grand-uncle, Julius Cæsar, who adopted A. as his son and heir. At the time of Cæsar's assassination (B.C. 44, March 15), A. was a student under the celebrated orator Apollodorus, at Apollonia in Illyricum, where, however, he had been sent chiefly with a view to gain practical instruction in military affairs. He returned to Italy, assuming the name of Julius Cæsar Octavianus, and at his landing at Brundisium was welcomed by deputies from the veterans there assembled; but declining their offers, he chose to enter Rome privately. The city was at this time divided between the two parties of the republicans and the friends of Mark Antony; but the latter had, by adroit maneuvers, gained the ascendancy, and had almost absolute power. A. was at first haughtily treated by the consul, who refused to surrender the property of Cæsar. After some fighting, in which Antony was worsted, and had to flee across the Alps, A., who had made himself a favorite with the people and the army, succeeded in getting the will of Julius Cæsar carried out. He found an able friend and advocate in Cicero, who had at first regarded him with contempt. The great orator, while imagining that he was laboring in behalf of the republic, was in fact only an instrument for raising A. to supreme power. When Antony returned from Gaul with Lepidus, A. joined them in establishing a triumvirate. He obtained Africa, Sardinia, and Sicily; Antony, Gaul; and Lepidus, Spain. Their power was soon made absolute by the massacre of those unfriendly to them in Italy, and by victories over the republican army in Macedonia, commanded by Brutus and Cassius. After the battle of Philippi, won by A. and Antony, of which the former unjustly claimed all the credit, whereas it mainly belonged to the latter, the triumvirs made a new division of the provinces—A. obtaining Italy, and Lepidus Africa. The Perusian war, excited by Fulvia, wife of Antony, seemed likely to lead to a contest between A. and his rival; but was ended by the death of Fulvia, and the subsequent marriage of Antony with Octavia, sister of Augustus. Shortly afterwards, the claims of Sextus Pompeius and Lepidus having been settled by force and fraud, the Roman world was divided between A. and Antony; and a contest for supremacy commenced between them. While Antony was lost in luxurious dissipation at the court of Cleopatra, A. was industriously striving to gain the love and confidence of

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the Roman people, and to damage his rival in public estimation. At length war was declared against the queen of Egypt, and at the naval battle of Actium (q.v.), B.C. 31, A. was victorious, and became sole ruler of the Roman world. Soon afterwards, Antony and Cleopatra ended their lives by suicide. The son of Antony by Fulvia, and Cæsarion, son of Cæsar and Cleopatra, were put to death; and in B.C. 29, after disposing of several affairs in Egypt, Greece, Syria, and Asia Minor, A. returned to Rome in triumph, and closing the temple of Janus, proclaimed universal peace.

His subsequent measures were mild and prudent. To insure popular favor, he abolished the laws of the triumvirate, adorned the city of Rome, and reformed many abuses. At the end of his seventh consulship (B.C. 27), he proposed to retire from office, in order that the old republican form of government might be re-established, but he was ultimately induced to retain his power. Hitherto, since Cæsar's death, the consul had been named Octavian; but now the title of *Augustus* (meaning 'sacred' or 'consecrated') was conferred on him. In the eleventh consulship of A. (B.C. 23), the tribunitian power was conferred on him for life by the senate. Republican names and forms still remained, but they were mere shadows. A. was in all but name absolute monarch. In B.C. 12, on the death of Lepidus, he had the high title of Pontifex Maximus, or High Priest, bestowed on him. The nation surrendered to him all the power and honor that it had to give.

After a course of victories in Asia, Spain, Pannonia, Dalmatia, Gaul, etc., A. (B.C. 9) suffered the greatest defeat he had sustained in his long career, in the person of his general, Quintilius Varus, whose army was totally destroyed by the Germans.

This loss so afflicted A., that for some time he allowed his beard and hair to grow, as a sign of deep mourning, and often exclaimed: 'O Varus, restore me my legions!' From this time A. confined himself to plans of domestic improvement and reform, and so beautified Rome, that it was said, 'A. found the city built of bricks, and left it built of marble.' He also founded cities in several parts of the empire; and altars were raised by the grateful people to commemorate his beneficence; while, by a decree of the senate, the name Augustus (August) was given to the month Sextilis.

Though surrounded thus with honor and prosperity, A. was not free from domestic trouble. The abandoned conduct of his daughter Julia was the cause of sore vexation to him. He had no son, and Marcellus, the son of his sister, and Caius and Lucius, the sons of his daughter, whom he had appointed as his successors and heirs, as well as his favorite step-son Drusus, all died early; while his step-son Tiberius was an unamiable character whom he could not love. Age, domestic sorrows, and failing health warned him to seek rest; and, to recruit his strength, he undertook a journey to Campania; but his infirmity increased, and he died at Nola in the 77th year of his age. According to tradition, shortly before his death, he called for a mirror,

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arranged his hair neatly, and said to his attendants: 'Have I played my part well? If so, applaud me!' A. had consummate tact and address as a ruler and politician, and could keep his plans in secrecy while he made use of the passions and talents of others to forward his own designs. The good and great measures which marked his reign were originated mostly by A. himself. He encouraged agriculture, patronized the arts and literature, and was himself an author; but only a few fragments of his writings have been preserved. Horace, Virgil, and all the most celebrated Latin poets and scholars were his friends. His was the *Augustan Age* of literature. His death threw a shade of sorrow over the whole Roman world; the bereaved people erected temples and altars to his memory, and numbered him among the gods.

AUGUSTUS, Elector of Saxony: 1526, July 31—1586, Feb. (ruled 1553–86); son of Duke Henry the Pious, and of Katherine of Mecklenburg; b. at Freiberg, then the seat of his father's court. In 1548, he married Anna, daughter of Christian III. of Denmark, who was universally popular for her devoted adherence to Lutheranism and her domestic worth. After the death of his brother, Maurice, 1553, A. succeeded to the electorate. His rule is noticeable chiefly as bearing upon the history of the newly established Protestant Church. Equally intolerant and inconsistent in his theology, A. first used his utmost influence in favor of the Calvinistic doctrine of the sacraments; and then, 1574, adopted the Lutheran tenets, and persecuted the Calvinists. On the other hand, however, it must be owned, to his honor, that, by his skilful internal administration, he raised his country far above the level of any other in Germany, introducing valuable reforms in jurisprudence and finance, and giving a decided impetus to education, agriculture, manufactures, and commerce. He even wrote a book on the management of orchards and gardens, and commanded that every newly-married pair should, within the first year of their marriage, plant two fruit-trees. The Dresden Library owes its origin to him, as do also most of its galleries of art and science. His own favorite private pursuit was that of alchemy, in which the Electress Anna took part. In 1586, Jan.—the electress having died in the previous year—A. married a young princess of Anhalt, but died a month after, and was buried in the cathedral of Freiberg. He was succeeded by his son, Christian I.

AUGUSTUS II., FREDERICK, commonly called the Strong. Elector of Saxony, King of Poland: 1670–1733, Feb.; b. Dresden; second son of the elector John George III. and of the Danish princess Anna Sophia. His extraordinary strength was developed by a careful physical education, and his mental faculties more successfully cultivated than his morals. From 1687 to 1689 he travelled over the greatest part of Europe, but was prohibited by his father from visiting Rome. Upon his father's death (1691), he went to Vienna, and there formed an intimacy with Joseph, King of Rome, which materially influenced his politics. When, in 1694, he succeeded to his brother George

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as elector, instead of turning his arms against France, according to previous arrangement, he undertook the command of the Austro Saxon army against the Turks in Hungary. After the battle of Olasch, 1696, he returned to Vienna as a candidate for the throne of Poland, vacated by John Sobieski. Bidding higher than Prince Conti for the crown (10,000,000 Polish florins), and adopting the Rom. Cath. faith, he was elected king by the venal nobles; and having, by his imposing force, awed the adherents of Conti, he was crowned at Cracow, 1697, Sep. 15. Ascending the throne, he promised to regain, for his new kingdom the provinces that had been ceded to Sweden; but his efforts to do this only led to the defeat of himself and his allies, his own deposition as king of Poland, the election of Stanislaus Leszcynski, and the ignominious peace of Altranstädt, 1706. So complete was his humiliation, that A. was compelled to send a letter of congratulation to the new Polish king, together with all the crown-jewels and archives. However, on receiving intelligence of the defeat of Charles XII. at Pultowa, 1709, he declared the treaty of Altranstädt annulled, marched with a powerful army into Poland, formed a fresh alliance with the czar, and recommenced a war with Sweden, which continued with fury, till the death of Charles XII. at Frederickshall, 1718, gave a new aspect to affairs, leading first to a truce, and eventually to a peace with Sweden. Meanwhile, a confederation, headed by a Polish nobleman, had been formed against the Saxons, and repulsed them with much success, till, in 1716, through the mediation of the czar, a compact was made between the Poles and A., agreeably to which the Saxon troops left the kingdom. The king now found himself obliged to employ conciliation, and the splendor of his dissolute court soon won the favor of the Polish nobles, who followed his example but too closely. Saxony had bitter cause to regret the union of the crowns. Its resources were shamefully squandered, even when want and famine were in the land, on the adornment of the capital, on the king's mistresses, his illegitimate children, and the alchemists who deluded him with hopes of the elixir of life. A. supported the fine arts as ministering to luxury, but did little for the cause of science. Despotic in principle, though easy in temper; ambitious as well as luxurious; reckless alike in the pursuit of war and pleasure, death overtook him in the midst of projected festivities. On his way to the Warsaw diet, gangrene of an old wound set in, he died, and was buried at Cracow. By his wife—a Protestant, dau. of the Margrave of Brandenburg Kulmbach—he left an only son, who succeeded to him. The most celebrated of his numerous illegitimate offspring—amounting, it is affirmed, to somewhere about 300—was Maurice, Count of Saxony.

AUGUSTUS III., FREDERICK, Elector of Saxony, King of Poland: 1696, Oct.—1763; the son and successor of Augustus II.; carefully educated by his mother in the Protestant faith. At the age of fifteen, however, he left her tutelage for a tour through Germany, France, and Italy, where he changed his religion, secretly professing

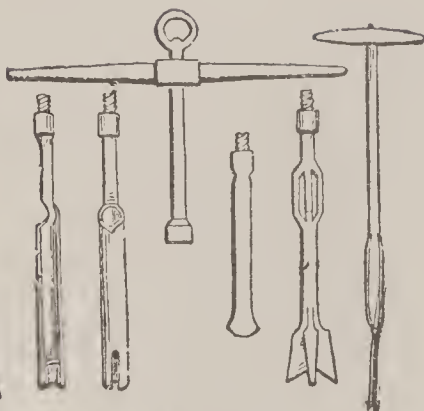
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adhesion to the Roman Church, at Bologna, 1712, though the fact was not publicly known in Saxony till five years later. It is possible that an eye to the crown of Poland, and to an alliance with one of the Austrian princesses, may have had something to do with this step. After succeeding his father in the electorate, 1733, he was chosen king of Poland by a part of the nobility, and triumphing over the rival claims of Stanislaus Leszcynski, supported by Louis XV., was unanimously proclaimed three years later. He inherited his father's sumptuous tastes, though not his talents; and his love of art, cultivated by his Italian tour, enriched the gallery of Dresden with noble paintings. The government of his country he made over entirely to his prime minister, Count von Bruhl, whose whole political system consisted in complete dependence upon Russia. In 1742, alarmed at the increased power Prussia had obtained by the conquest of Silesia, A. formed an alliance with Maria Theresa; and by the secret treaty of Leipsic, contracted to supply her with 50,000 men. But their united troops were completely routed by the Prussians, 1745; Frederick II. pushed on into Saxony, and A. fled from his capital, saving his art-treasures, but leaving his state-papers in the hands of the conqueror. In 1746, the peace of Dresden restored him Saxony; but the close of the year again saw him embroiled with Prussia. Joining the camp at Pirna, he narrowly escaped being taken prisoner, and fled to Poland, where his popularity, never very great, was much diminished by his recent reverses in Saxony, added to which the Empress Catherine of Russia used every effort to dislodge him, as being an ally of France. At the conclusion of the peace of Hubertsburg, A. returned to Dresden, where he died. His son, Frederick Christian, succeeded him in the electorate, and Stanislaus Poniatowski became king of Poland.

AUK, *awk* [Dan. *alke*], (*Alca*): genus of web-footed birds, type of a family called *Alcedæ*, which was in great part included in the Linnæan genus *Alca*, and to many of the species of which, now ranked in other genera, the name A. is still popularly extended. The *Alcedæ* are among those web-footed birds called *Brachypteres* (i.e., short-winged) or Divers by Cuvier, remarkable for the shortness of their wings, which they employ as fins or paddles for swimming under water, some being even incapable of flying; and for the position of their legs, further backward than in other birds, which makes walking difficult, and compels them, when on land, to maintain an upright attitude. They are distinguished by the very compressed bill, which, in the true auks, is vertically elevated, and so sharp along the ridge as to resemble the blade of a knife; and by their entirely palmated feet, destitute of hind toes. The auks are confined to the seas of the n. hemisphere—the penguins taking their place in the s. All of them have a dense plumage, generally with a beautifully polished appearance and silvery lustre. The genus *Alca*, as restricted by Cuvier and others, contains only two species, distinguished from the *Puffins* (q.v.),



Aucuba japonica.



Augers.



Cæsar as an Augur.—
From a Roman bas-relief.



The Great Auk (*Alca impennis*).

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which also belong to this family, chiefly by the greater length of the bill, and its being covered with feathers as far as the nostrils. The bill, both in the auks and puffins, is transversely and strongly grooved. But even the two known species of the restricted genus *Alca* differ from one another in a most important particular—the wings of the one, the Great A., being so short that it is quite incapable of flight, like the penguins, of which it may be deemed the true northern representative, while the other, the razor-bill, has comparatively long wings, and flies well.

The GREAT AUK (*Alca impennis*), so far as is known, is now extinct. It was about three ft. in height, an inhabitant of the temperate region of the n. Atlantic. At one time large numbers bred on St. Kilda, and in prehistoric times it appears to have bred on Oronsay or neighboring skerries, and possibly frequented other islands of the Hebrides. It was occasionally seen at Orkney and Shetland, and probably bred at Papa Westra until 1812. It was rare along the shores of Norway and Sweden, but in prehistoric times frequented the fjords of Denmark, as its remains have been repeatedly found in the Danish kjökken-möddings. There is only one breeding-place in Greenland on record, and that is Gunnbjorneskjoerne, supposed the same as Danell's or Graah's Islands. It bred on several skerries off the coast of Iceland, and the last Great Auks are supposed to have been killed on one of these named Eldey in 1844. In the North American habitat it bred in great numbers on Funk and other islands off the coast of Newfoundland, on some islands in the Bay of St. Lawrence, at Cape Breton, and probably at Cape Cod. Its remains have been found in shell-heaps at several places on the coast of Maine and Massachusetts. The Great Auk was invaluable as food, and but for the abundant fresh supplies afforded by its carcasses to the early voyagers, the fisheries at the Banks of Newfoundland would hardly have been developed as they were. The birds were so stupid, they sat still until they were knocked over by the seamen's short clubs, or allowed themselves to be driven on board the vessels in hundreds across sails or planks stretched from the gunwales to the shore. The rapidity with which this bird moved under water was extraordinary; one of them having been pursued by a six-oared boat for hours in vain. Like most of the *Alcadæ*, the Great Auk each year laid only one egg, about 5 inches in length, and 3 in maximum breadth. It laid it on the bare rock, without any attempt at a nest.—The RAZOR-BILL (q.v.) (*A. torda*) is the only other species now commonly included in the genus *Alca*. The name LITTLE AUK is often given to a bird called also the ROTCHE (q.v.) (*Mergulus alle*, formerly *Alca alle*), common in Arctic regions.—The common puffin is sometimes called the Labrador Auk.—The n. parts of the Pacific Ocean abound in auks remarkable for a somewhat quadrangular bill, notched near the tip, and which form the genus *Phaleris*. One of them, *P. psittacula*, is known as the Parrakeet Auk.—All the auks

.AULA—AULIC.

feed upon fishes, crustaceans, and other marine animals, which they pursue under water, and for which they dive to great depths. See Symington Grieve's *The Great Auk* (Edin. 1885).

AULA, n. *aw'la* [L. *aula*—from Gr. *aulē*, a courtyard or its wall; the court or quadrangle around which the house itself was built; any court or hall; the court, or *aula regia*]: a court barn; in some old *eccl. writers*, the nave of a church. A. REGIA or REGIS, a court established by William the Conqueror in his own hall, and comprised of the great officers of state usually attendant on his person. It was ultimately transferred to Westminster Hall.

AULAPOLAY', or ALEPPI: town of India, in the native state of Travancore, on the sea-coast; 9° 30' n. lat., 76° 24' e. long. There is no shelter for shipping, but ships anchor four or five m. from the shore. There is considerable trade in timber, betel-nut, coir, pepper, and cardamoms. This town communicates with Quilon and Trivandrum on the s., and with Cochin on the n., by canals parallel with the sea-coast, connecting a series of lakes or back-waters. Between these and the sea is a communication by a wide creek, through which the timber for exportation is floated, brought from the forests of the Rajah of Travancore on the Western Ghauts.

AULARIAN, n. *aw-lū'rī-ān* [L. *aula*, a hall]. at Oxford, the member of a hall, as distinguished from a collegian.

AULAX, n. *aw'lāks* [Gr. *aulax*, a furrow, in allusion to the furrows on the under side of the leaves in one species]: genus of plants belonging to order *Proteaceæ*, or *Proteads*. The species are pretty shrubs, with narrow leaves.

AULD LANG-SYNE, n. *awld' lāng-sīn'* [Scot. *auld*, old; *langsyne*, time long past—from *lang*, long, and *syne*, then, time past, since]: days that are long past; long, long ago.

AULETIC, a. *aw-lēt'ik* [Gr. *auletikos*, suitable for a pipe or flute—from *aulos*, a flute or other wind instrument]: pertaining to the pipe or flute.

AULIC, a. *aw'lik* [L. *aulicus*; Gr. *aulikos*—from Gr. *aulē*, a royal palace]: of or pertaining to a royal court.

AULIC COUNCIL: one of the two highest courts of the old German empire, co-ordinate with the Imperial Chamber. It came into existence 1495, and seems to have been at first employed principally in preparing business matters regarding the crown lands and the empire generally, in order to expedite the decisions of the Imperial Chamber. It soon began to assume or acquire higher functions. After 1502, the states submitted important grievances to its independent consideration; but it did not receive a fixed constitution before 1559. In 1654, it was formally recognized as the second of the two supreme courts, and equal in dignity to the Imperial Chamber. It was composed of a pres., a vice-pres., a vice-chancellor, and eighteen councilors, all chosen and paid by the emperor, with the exception of the

AULOPUS—AUMALE.

vice-chancellor, who was appointed by the Elector of Mainz. Of the eighteen councilors, six were Protestants, whose votes, when they were unanimous, could not be set aside by those of the others, so that a religious parity was to some extent preserved. The councilors were divided into three classes—counts, barons, and men of learning—all of whom were on a footing of equality, except that the last mentioned received a higher salary, and were usually advanced into the ranks of the nobility. The council held aloof from politics, but under its jurisdiction were placed: 1st, all matters of feudality in which the emperor was immediately concerned; 2d, all questions of appeal on the part of the states from decisions in favor of the emperor in minor courts; 3d, whatever concerned the imperial jurisdiction in Italy. On the death of the emperor, the council was dissolved, and had to be reconstructed by his successor. It finally ceased to exist on the extinction of the old German empire, 1806.

AULOPUS, n. *awl'op-ŭs* [Gr. *aulos*, a flute; *pous*, foot]: genus of fishes belonging to family *Salmonidæ*.

AULOSTOMA, n. *aw-lŏs'tom-a*, or AULOS'TOMUS, n. [Gr. *aulos*, a flute; *stoma*, mouth—*lit.*, flute-mouthed]: genus of spiny-finned fishes, of family *Fistularidæ*. Like the rest of the family, the snout ends in a tube. The only known species is from the Indian Ocean.

AUMAILED, a. *aw māl'd'*: OE. for ENAMELLED (q.v.).

AUMALE, *ō-māl'*: town of Algeria; on one of the head waters of the Sahel, 57 m. s.e. from Algiers; on the great road from Algiers to Constantine. It is a strong military post, with barracks, magazines, and hospitals. Pop. 5,196, of whom 1,468 European.

AUMALE, *ō-māl'*, CHARLES DE LORRAINE, Due d': 1554-1631; an ardent partisan of the League in the politico-religious wars which devastated France in the latter half of the 16th c. The aim of the League was ostensibly to suppress the Huguenots, but in reality to secure the supreme power to the Guises. Closely allied by blood to this crafty and ambitious family, A. from the very first entered with fanatical sympathy into its schemes; and after the murder of the Duke of Guise at Blois in December, 1588, he became, with the Duke of Mayenne, the leader of the party. In 1589, he seized Paris, dissolved the parliament, and imprisoned its members. Shortly afterwards he put himself at the head of a body of troops to attack the town of Senlis, but was defeated by La Noue, and compelled to retreat. Always unfortunate in war, his presence seemed to insure the overthrow of his friends. He commanded a portion of the forces of the League at the battles of Arques and Ivry, where the Huguenots triumphed under their skilful and sagacious monarch, Henry IV. But A. was as obstinate as he was unlucky, and in the end proved himself as traitorous as he was obstinate. He held out for the League in Amiens until the populace expelled him, when he suddenly allied himself with the Spaniards who had invaded Picardy, refused the royal pardon, and delivered

AUMALE—AUNOY.

over to the enemy several places in his possession. For this he was impeached, condemned, and sentenced to be broken alive on the wheel. His property was confiscated, but he himself escaped, and lived in exile till his death.

AUMALE, HENRI-EUGÈNE-PHILIPPE, LOUIS D'ORLEANS, Duc d': b. Paris, 1822, Jan. 16; fourth son of the late king of France, Louis Philippe. He enjoyed the privilege—rare among princes—of being educated with his fellow-men, at the college of Henri IV. When 16 years of age, he entered the army, soon distinguished himself by his bravery, and passed rapidly through the various grades of rank. In 1843, in Algeria, he commanded a subdivision of the French army, and performed some brilliant exploits, the most signal of which was his surprising Abd-el-Kader, when encamped in the environs of Goudjilab, 1843, May 16, capturing a multitude of cattle, 4 standards, 3,600 prisoners, and the correspondence and treasure of the emir. He was, in consequence, elevated to the rank of lieut.gen., and appointed to the government of the prov. of Constantine. In 1847, he succeeded Marshal Bugeaud as gov.gen. of Algeria. While holding this high office, he was exposed to a series of bitter attacks by the democratic 'opposition' in the chamber of deputies, but was ably defended by Guizot. After the expulsion of his father, he withdrew from Algeria, having first, with self-denying patriotism, exhorted the colony peaceably to obey the orders of the metropolis. He resided in England till 1871, when he returned to France, and was elected a member of the assembly. He was elected a general of division, 1872, and presided over the council of war which tried Marshal Bazaine. He was elected a member of the Academy 1871, expelled from France 1886, July 13, and authorized to return 1889, Mar. 9. He notified the French people 1886, Aug. 29, of his intention to bequeath to the Institute of France his domain of Chantilly, with all its vast treasures of war, art, literature, and history, the whole estimated to be worth \$50,000,000. He died 1897.

AUMBRY, n. *awm'brī*, or AUMRY, n. *awm'rī* [other spellings of AMBRY, which see]: in a church or cathedral, a closet in the side of the wall by the altar, in which the sacred vessels were kept; they are of different sizes in other parts of a sacred edifice, and used for various purposes.

AUME: see AWME.

AUNE, *ōn*: French cloth-measure corresponding to the English *ell*. Both words are derived from the Lat. *ulna*. The English ell = $1\frac{1}{4}$ yard = 45 inches; the French *aune usuelle* (or *nouvelle*) = $1\frac{1}{5}$ mètre = $47\frac{1}{4}$ inches English. The old *aune* was a little shorter.

AUNOY, *ō-nwā*, MARIE-CATHERINE-JUELLE DE BERNEVILLE, Comtesse d': abt. 1650—1705, Jan.: celebrated French authoress of the reign of Louis XIV. She composed fairy tales, romances, and historical memoirs. Among her fairy tales were *The Yellow Dwarf*, *The White Cat*, and *Cherry and Fair Star*. Many of these fictions have been translated into English, and are greedily read

AUNT—AURANTIACEÆ.

AUNT, n. *ânt* [F. *tante*: OF. *ante*, an aunt—from L. *amita*, an aunt]: the sister of one's father or mother.

AURA, n. *aw'ra* [L. and Gr. *aura*—from Gr. *āō*, I blow or breathe]: a very gentle breeze; a breath; a subtle invisible vapor supposed to proceed from a body; in *med.*, a peculiar sensation which sometimes gives warning of a fit of epilepsy. AURIC, a. *aw'rik*, pertaining to the aura.

AURAL, a. *aw'rāl* [L. *auris*, an ear]: pertaining to the ear and its diseases.

AURALITE, n. *aw'ra-līt* [Ger. *auralit*—from *aura* (?); Gr. *lithos*, stone]: a mineral from Abo, in Finland. According to the Brit. Mus. Catalogue, it is a variety of Dichroite; according to Dana, it is an altered condition of Iolite.

AURANTIACEÆ, *aw-răn'tĭ-ă'sē-ē* [from *aurantium*, mod. Lat. for an orange]: a nat. ord. of exogenous plants, shrubs, and trees, now appended to the order *Rutaceæ*. Both leaves and bark are generally very smooth, and all parts are filled with little transparent receptacles of a fragrant volatile oil, which especially abounds in the leaves and in the rind of the fruit. The leaves are alternate, and always articulated with their stalks, which are frequently winged. The flowers have a short, 3-5 toothed, withering calyx, and 3-5 petals, which are broad at the base, sometimes slightly coherent, and imbricated in bud. The stamens are equal in number to the petals, or a multiple of their number; the filaments sometimes slightly coherent in one or more bundles; the anthers terminal and erect. The stamens and petals are inserted on a disk. The ovary is free; there is one style with a thickish stigma. The fruit (a *hesperidium*) is pulpy, with a leathery or spongy rind, of one cell, or of a number of separable cells; the seeds attached to the axis, with thick cotyledons and no albumen, not unfrequently containing more embryos than one.—The order contains abt. 100 known species, natives of warm climates, and almost all of the East Indies. The species of the genus *Citrus* (q.v.) are the best known, among which are the orange, lemon, citron, etc. But the order contains many other plants producing agreeable fruits, among which the *Ægle Marmelos* (see *ÆGLE*)—called Bhel, or Bael, in India—*Cookia punctata* (the Wampee), *Glycosmis citrifolia*, and *Triphasia trifoliata* deserve particular notice. The fruits ripe, and unripe, juice and rind, the flowers, leaves, bark, etc., of a number of species are employed medicinally. The leaves of *Bergera Koenigii* are used by the Hindus as a stomachic and tonic, the bark and roots as stimulants.—*Feronia elephantum*, a large tree growing in most parts of India, yields a gum which closely resembles gum-arabic, and is used for similar purposes. The young leaves of this tree have a smell like that of anise, and are used by the native practitioners of India as a stomachic and carminative.—*Skimmia* (or *Limonia*) *Laureola* and *Skimmia Japonica* are remarkable exceptions in this order, as to the climate to which they are adapted: the former grows on the cold and lofty mountains of the n. of India,

AURATE—AURELIANUS.

braving frost and snow; the latter, a beautiful shrub, recently introduced into Britain from Japan, is perfectly hardy even in the severest winters; its evergreen leaves and pretty little red berries remaining uninjured by frost.

AURATE, *n.* *aw'rāt* [L. *aurum*, gold]: a salt of auric acid. AURA'TED, *a.* of or like gold. AURIC, *a.* *aw'rik*, of or from gold; resembling gold; pertaining to gold; in *chem.* applied to those gold compounds in which that element has its higher valency, e.g., auric sulphide, auric oxide. AUROUS, *n.* *aw'rūs*, full of gold; (more loosely) containing more or less of gold; in *chem.*, with gold univalent in its composition.

AUREATE, *a.* *aw'rē-āt* [mid L. *aurēātus*, golden—from *aurātus*, gilded—from L. *aurum*, gold]: in *OE.*, golden. AUREOLIN, *n.* *aw-rē-ō-līn*, name in trade for the pigment cobalt-yellow. AUREOUS, *a.* *aw'rē-ūs*, of golden-yellow color.

AURELIA, *n.* *aw-rē'li-a* [L. *aurum*, gold: *au'rēolus*, golden]: the chrysalis of an insect, more especially of a butterfly. See CHRYSALIS. AURE'LIAN, *a.* -ī-ān, pertaining to the aurelia: *N.* an amateur collection of insects. AUREOLA, *a.* *aw-rē'ō-lā*, golden, as applied to a crown or golden nimbus: *N.* a circle of rays round the head of a portrait, to indicate something more than human—popularly called a glory.

AURELIANUS, *aw-rē-li-ā'nūs*, LUCIUS DOMITIUS—also named CLAUDIUS DOMITIUS and VALERIUS—one of the most powerful of the Roman emperors: 212–276; of humble origin, his father having been a husbandman. Enlisting early as a common soldier, he rapidly distinguished himself, and held the highest military offices under Valerianus and Claudius II. On the death of Claudius (270), A. was elected emperor by the army. He commenced his reign by vigorous attack on the barbarian Alemanni, or Marcomanni, whom he expelled. Thereafter, he began a new line of fortified walls round Rome, not completed till the reign of Probus (276). Their ruins still mark the boundaries of Rome in the time of Aurelian. Finding that the province of Dacia (now Wallachia) could not be maintained against the assaults of the Goths, he surrendered it, on certain conditions, and strengthened the frontier of the Roman empire by making the Danube its boundary. He next turned his attention to the East, where the renowned queen Zenobia (q.v.) had extended her sway from Syria to Asia Minor and Egypt. A. defeated her in two battles, and besieged her in Palmyra, from which she attempted to escape, when she saw defense would prove unavailing. She was taken prisoner, and soon the city surrendered, and was treated leniently. Shortly after A. had departed, a new insurrection took place. He returned, in 273, and gave the splendid city up to destruction. A. was again called to the East by a rebellion in Egypt, instigated by Firmus, a merchant of great influence, which he speedily quelled. Besides, Tetricus, who had held imperial power in Gaul since before the death of Gallienus, finding himself unable to wield it, surrendered it to Aurelian. By restoring good discipline in the army, order in domestic affairs, and political unity to the Roman dominions, A. merited the title awarded to him by the

AURELIUS—AURI-ARGENTIFEROUS.

senate—'Restorer of the Roman Empire.' He fell a victim to conspiracy during his campaign against the Persians.

AURELIUS, MARCUS: see ANTONINUS.

AURELLE DE PALADINES, *ō-rěł' děh pá-lá-děh*, LOUIS JEAN BAPTISTE D': soldier: 1804, Jan. 9—1877, Dec. 17; b. Mabzieu, Lozère, France. Educated at St. Cyr milit. school, he entered the army 1824; served with distinction in Africa 1841–48; brig.gen. 1851. He earned high distinction at the Alma and at Inkermann in the Crimean war. He was promoted gen. of div. 1855; retired 1870, but on the outbreak of the war with Germany, was given command of the army of the Loire, which he thoroughly organized. 1870, Nov. 9, he defeated the Bavarian gen. Von der Tann at Coulmiers; but in Dec. suffered severe loss in a conflict with the army of Prince Friedrich Karl, of Prussia, and was removed from his command. He was chosen life senator 1876. He wrote: *Campagne de 1870–1*; and *La Première Armée de la Loire*.

AUREOLA, n. *aw-rě'o-la* [from L.L. adj. *aureolus*, dim. of L. *aureus*, golden]: in *Christian art*, a gold-colored or gilded background, representing an emanation of rays of glory, given to figures or symbols of the three persons of the divine trinity, of Jesus Christ, of the Madonna and Child, or of the Virgin alone, particularly when she is portrayed in her assumption into heaven. In form the A. is usually oval, and hence it is sometimes called *scutum* (shield) and *vesica piscis* (fish-bladder). The A. differs from the Nimbus (q.v.) in that the nimbus represents rays of glory emanating from and surrounding only the head of the subject, while A. is very commonly employed in both senses. In German, too, the words *Heiligenschein* (radiance of holiness) and *Glorie* are used indifferently to signify A. and nimbus. In the language of mediæval theol. the A. is a certain special enhancement of the essential glory of the elect in heaven, and is awarded to certain orders of the blest. Thomas Aquinas gives it to virgins, martyrs, doctors, and preachers: to virgins because of their triumph over the flesh, to martyrs for their triumph over the world; to doctors and preachers for their triumph over the devil.

AUREOLE, n. *aw'rě-ōl* [L.L. *aureola*]: an aureola (q.v.); a nimbus; a halo real or figurative.

AUREUS, n. *aw'rě-ūs* [L., of gold]: anc. Roman gold coin first minted B.C. 207, with the same die as the denarius (q.v.), hence called *denarius aureus* (gold denar). The first aurei issued were of very fine gold, weighing $\frac{1}{40}$ lb., and each was equivalent to 25 silver denarii or 100 sesterces (q.v.). Under the commonwealth the A. was very seldom coined; under the emperors it was issued frequently, but its weight was steadily diminished: under Marcus Aurelius it weighed $\frac{1}{32}$ lb.; and under Caracalla $\frac{1}{50}$ lb. In Constantine's reign and afterward it was called solidus (q.v.).

AU REVOIR, *ō rě-vwōr'* [F.]: till we meet again; good-bye.

AURI-ARGENTIFEROUS, a. *aw'rī-ār-jěnt-ĭf'ěr-ūs* [L. *aurum*, gold; *argentum*, silver; *fero*, bear, carry]: bearing or containing gold and silver.

AURICHALCITE—AURICULA.

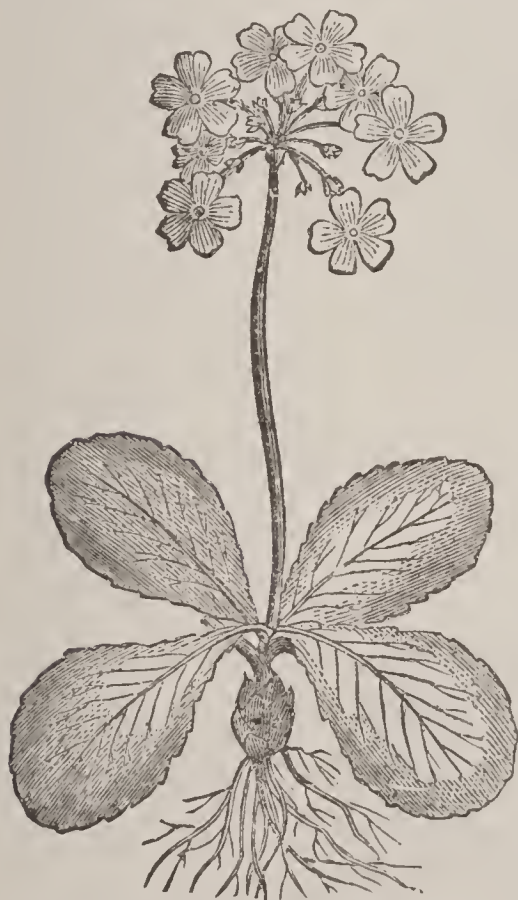
AURICHALCITE, n. *aw-rĭ-kăl'sīt* [L. *aurichalcum* or *orichalcum*—from Gr. *orichalkos*, yellow copper ore—from *oros*, a mountain, *chalkos*, copper, bronze, brass]: a mineral placed by Dana under the fourth section of his Hydrous Carbonates. It occurs in acicular crystals, forming drusy incrustations; also columnar, plumose, granular, or laminated. Its lustre is pearly; its color pale green, or sometimes azure. The hardness is 2. A. is a basic carbonate of zinc and copper, formerly called brass ore because containing zinc and copper, though not brassy in appearance. The composition: oxide of copper, 16·03 to 32·5; oxide of zinc, 32·02 to 56·82; carbonic acid, 14·08 to 24·69; water, 9·93 to 10·80; lime, 0 to 8·62. It is found in England, Scotland, Spain, Asia, and America. Buratite, by some called *lime aurichalcite*, occurs in France and Austro-Hungary.

AURICLE, n. *aw'rĭ-kl* [L. *auricula*, the ear-flap—from *auris*, an ear: F. *auricule*]: the outside ear; that cavity in the heart which receives the blood from the system or breathing organs, and pumps it into the ventricle—in the human heart the auricles being somewhat ear-shaped. See **HEART**.

AURICLED, a. *aw'rĭ-kld*, having ear-shaped lateral appendages. **AURICULAR**, a. *aw-rĭk'ŭ-lĕr*, pertaining to the ear; told to the ear; secret. **AURICULARLY**, ad. *-lĭ*. **AURICULAR CONFESSION**, confession of sins made in the ear of the priest in the confessional with a view to absolution. **AURICULATE**, a. *-lăt*, or **AURICULATED**, a. shaped like the ear.

AURIFORM, a. *aw'rĭ-fawrm* [L. *forma*, a shape]: in the shape

of an ear. **AURIST**, n. one who treats diseases of the ear. **AURISCOPE**, n. *aw'rĭ-skōp* [Gr. *skopĕō*, I see or view]: an instrument which covers the auricle in order to ascertain by it the condition of the internal ear and its passage. **AURICULO-VENTRICULAR ORIFICE**, n. the orifice through which the blood passes from the auricle into the ventricle. It is guarded on either side by valves. **AURICULA**, n. *aw-rĭk'ŭ-lă*, a species of primrose called *bear's ear*, a native of Swiss Alps, ord. *Primulacæ*.



Auricula (wild state).

gardens. It was highly esteemed by the Romans, and

AURICULA, *aw-rĭk'ŭ-la* (*Primula Auricula*): a plant of the same genus with the Primrose (q.v.), much cultivated in flower-

PLATE 24.

Auk
Aurochs



Auk.—Razor-bill (*Alca torda*).



Auricula (*Primula auriculæ*).



Auricula (*Primula auricula*.) Another specimen.



Aurochs (*Bos urus*).

AURICULA.

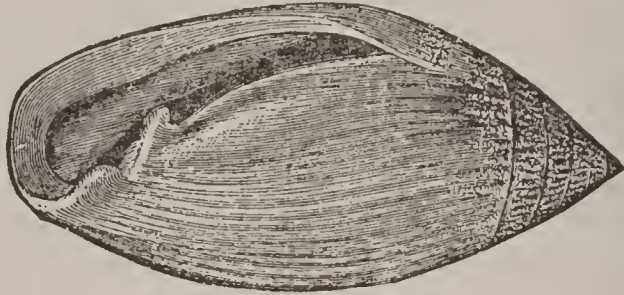
has, for nearly 200 years, received particular attention from the florists of England and Holland. Its cultivation is very successful in the little gardens of operatives near large towns. The A. has smooth, dark-green leaves, scapes (or leafless stems), and calyxes, covered with a mealy powder. A similar fine meal appears also on the flowers, and adds much to their beauty. The A. is a native of the Alps and other mountains of the middle and s. of Europe, and of sub-alpine situations in the same countries. It is found also on the Caucasus and the mountains of Syria ; it grows in shady and moist places. In a wild state, it has comparatively small flowers, of a simple yellow color, on short stalks, forming an umbel of generally six or seven on one scape, with the same delightful fragrance which it has in cultivation. The leaves are used by the inhabitants of the Alps as a remedy for coughs.

By cultivation and art, the A. has been brought to great splendor of color. Red, pink, crimson, apple-green, and mulberry are the chief colors of the different varieties. More than 1200 varieties have been reckoned, and new ones are continually appearing, some entirely of one color, others of two or more; some delicately shaded, some variegated. The mere color of an A. is not of so much consequence, in the eye of a florist, as the form and shading. The chief requisites of a good A. are large flowers, so many of them on one scape as to give fulness to the umbel, the flower-stalks so strong that the flowers do not hang down; the scape itself must be so tall that the umbel of flowers may rise completely above the leaves, and so strong as to bear it erect; the flower must be nearly round; the white or yellow eye in its centre must be distinct and round, its color not mixing with the ground color, which, however, may mix at the outer part with the green of the margin. The green margin adds much to the beauty of many varieties. The mealiness of the flower differs much in different varieties.—The A. blooms in April and May, and often a second time in the end of autumn. It thrives in a rich light soil, and cultivators diligently prepare for it composts of various kinds, in general chiefly of fresh loamy soil, and of well-rotted horse or cow dung, often with a little sand. The finer varieties are always cultivated in pots, and require great attention. They are protected from the severe weather of winter, and during the flowering season from wind and rain. They ought, however, previous to flowering, to stand in an airy, sunny situation. They are propagated by offsets, generally in the latter part of August.—When it is proposed to raise the A. from seed, care ought to be taken to select the finest flowers, which are encouraged to ripen their seeds by exposure to sun and air, hand-glasses being placed over them during heavy rains. The seed is sown either in autumn or spring, generally in boxes placed under shelter, or in a slight hot-bed. The more weakly plants are tended with particular care, as they are generally found to produce the finest flowers.

The name A., originally Latin, is derived from *auris*, an ear, on account of a fancied resemblance of the leaves to the ears of an animal.

AURICULA—AURILLAC.

AURIC'ULA: a genus—and **AURICU'LIDÆ**: a family—of Gastropod Mollusca. They have a spiral shell, covered with a horny epidermis, the first whirl very large and the spire short, the aperture elongated and toothed. They belong to that section of Gastropods in which the sexes are united in the individual, and to the same order with



Auricula.

the common snails, having respiratory organs adapted for breathing in air, though some of them are capable of subsisting for a considerable time in water. Some of them inhabit fresh-water marshes, others prefer the vicinity of salt water. They generally belong to warm climates, and some of them attain a large size. *Auricula Midæ*, a native of the East Indies, is known to shell-collectors by the name of Midas's Ear.

AURIC'ULAR CONFESSION: see **CONFESSION**.

AURIC'ULATE, in Botany: a term applied to leaves, stipules, etc.; signifying that they have at the base two small ear-like lobes.

AURIFEROUS, a. *aw-rĭf'ēr-ŭs* [L. *aurum*, gold; *fĕro*, I produce]: yielding or producing gold.

AURIGA, n. *aw-rĭ'ga* [Sp. and L. *auriga*, a wagoner—from *aurea*, a bridle; *ago*, I drive, I manage]: one of the ancient northern constellations, the Wagoner; in *anat.*, the fourth lobe of the liver; in *surgery*, a bandage for the sides.

AURIGRAPHY, n. *aw-rĭg'ra-fĭ* [L. *aurum*, gold; Gr. *grapho*, I write]: the act or process of writing with gold instead of ink.

AURILLAC, *ō-rĕ-yāk'*: t. of France, cap. of the dept. of Cantal (Auvergne); in a pleasant valley on the banks of the Jourdanne, about 269 m. s. from Paris. It is said to owe its origin to a Benedictine monastery founded in the 9th c. by St. Gerard. The English, in the 14th and 15th centuries, often besieged the town, and it was frequently taken and pillaged during the religious wars in France in the 16th c. The streets are wide but irregular, and are kept clean by streams supplied by a reservoir above the town and by a canal from the Jourdanne. The neighboring quarries supply slates to cover the houses. The principal buildings of A. are the churches of Notre Dame and St. Gerard, St. Stephen's Castle, the theatre, college buildings, which contain a valuable public library, and the corn-market. Paper, jewelry, lace, copper

AURIN—AURORA.

utensils, leather, and beer are the chief industrial products. Pop. (1896) 16,886.

AURIN, n. *aw'rĭn* [L. *aurum*, gold]: a substance of a golden-red color obtained from earbolic acid; one of the aniline dyes, known also as 'rosolic acid' or 'coralline yellow.'

AURIUM, n. *aw'rĭ-ŭm* [L. gen. pl. of *auris*, an ear]: in *med.*, *aurium tinnitus*, tingling of the ears, i.e., in the ears.

AUROCHS, n. plu. *aw'rĭks* [Ger. *aurochs* and *auerochs*; L. *urus*; Gr. *ouros*, a wild bull]: the bison or wild ox of Poland.

AURORA, n. *aw-rō'ră* [L. *Aurōra*, the goddess of the morning]: the rising light of the morning; the plant crow-foot. **AURO'RAL**, a. belonging to the morning. **AURO'RA BOREALIS**, n. *bōr'ē-ā'līs*, shooting lights of varied colors seen in the northern parts of the heavens, generally called the northern lights. **AURORA AUSTRALIS**, n. *-aws-tră'līs*, the southern lights.

AURORA, *aw-rō'ra*: city in Kane co., Ill.; on the Fox river, and the Chicago and Iowa, and Chicago Burlington and Quincy railroads; 38 m. from Chicago. It has a capable fire department, provided with steam fire-engines and Holly water-works, a fine city hall, iron bridges, a handsome hall used for a public library, Young Men's Christian Association building, etc. The city is lighted by electricity. There are two national banks and a number of important manufacturing establishments which obtain power from the Fox river. There are here railroad repair shops; these, belonging to the Chicago Burlington and Quincy railroad, employing about one thousand men. A. has excellent public schools; also the Jennings Seminary, which is of high repute. Pop. (1870) 11,162; (1880) 11,873; (1890) 19,688; (1900) 24,147.

AURORA: city in Dearborn co., Ind.; on the Ohio river; 25 m. below Cincinnati, on the Louisville branch of the Ohio and Mississippi railroad. It has a large trade in hay, a number of manufactories, a high school, one national bank, and publishes three weekly papers. Its river trade is large and growing rapidly. Pop. (1870) 3,304; (1880) 4,434; (1890) 3,929; (1900) 3,645.

AURO'RA (styled *Eōs* by the Greeks): the goddess of the dawn, or 'morning redness;' dau. of Hyperion and Theia, sister of Helios and Selene, wife of the Titan Astræus. Zephyrus, Boreas, Notus, Hesperus, and the other stars were her children. She was described as rising in the morning from her bed in the ocean, borne along on a chariot drawn by the divine steeds Lampus and Phaëton, ascending heaven from the river Oceanus, where she lifted with her 'rosy fingers' the curtain of night, and announced the light both to gods and men. Homer frequently describes A. as the goddess of day, and the tragic writers identified A. with *Hemera* (the day). She was represented as clothed in a rosy-yellow robe, with a star

AURORA BOREALIS.

enfining on her forehead, and a torch in her right hand. She had a passion for mortal youths, and carried off Orion, Cleitus, and Tithonus.

AURORA BOREALIS, *aw-rō'ra bōr'ē-ā'līs*, or NORTHERN LIGHTS (Ger. *Nordlicht*): the luminous phenomenon seen towards the north of the heavens by the inhabitants of the higher latitudes. During the winter of the n. hemisphere, the inhabitants of the arctic zone are without the light of the sun for months together, and their long dreary night is relieved by the light of this beautiful meteor, frequent in those regions. Those who have explored the southern seas have seen the same phenomenon in the direction of the south pole, so that the term Polar Lights might be more appropriate than Northern Lights to designate the aurora. The appearance of the Aurora Borealis has been described by a great variety of observers, both in northern and central Europe, all substantially to the same effect. A dingy aspect of the sky in the direction of the north is generally the precursor of the Aurora Borealis;



Aurora Borealis.

this gradually becomes darker in color, and assumes the form of a circular segment surrounded by a luminous arch, and resting at each end on the horizon. This *dark segment*, as it is called, has the appearance of a thick cloud, and is frequently seen as such in the fading twilight before the development of the auroral light. Its density must, however, be very small, as stars are sometimes seen shining brightly through it. This dark segment is bounded by a luminous *arch* of a bluish-white color, which varies in breadth from 1 to 6 diameters of the moon, having the lower edge sharply defined, and the upper edge only when the breadth of the arch is small. This arch may be con-

AURORA BOREALIS.

sidered to be a part of a luminous ring elevated at a considerable distance above the earth's surface, and having its centre corresponding with some point near the n. pole. An observer several degrees s. of this auroral ring would see towards the n. only a small arc of it, the larger part being hid by the earth; to one situated not so far s. it would appear as a larger and higher arch; to one placed below it, it would be seen as an arch passing through the zenith; and to one within the ring and further n. it would be found as an arch culminating in the s. On this supposition, nearly all the various positions of the auroral arch may be accounted for. The centre of the ring corresponds probably with the magnetic north, which is at present situated in the island of Boothia Felix. Hence it is that in Greenland, to the east of this island, the auroral arch has been seen stretching from n. to s. with its highest point in the w. The luminous arch, once formed, remains visible for several hours, and is in a constant state of motion. It rises and falls, extends towards the e. and towards the w., and breaks sometimes in one part, sometimes in another. These motions become all the more observable when the arch is about to shoot forth *rays*; then it becomes luminous at one point, eats in upon the dark segment, and a ray of similar brightness to the arch mounts with the rapidity of lightning towards the zenith. The ray seldom keeps the same form for any length of time; but undergoes continual changes, moving e. and w., and fluttering like a ribbon agitated by the wind. After some time, it gradually fades in brightness, and at last gives way to other rays. When the aurora attains its full brightness and activity, rays are projected from every part of the arch, and if they do not rise too high, it presents the appearance of a comb furnished with teeth. When the rays are very bright, they sometimes assume a green, sometimes a violet, a purple, or a rose color, giving to the whole a variegated and brilliant effect. The accompanying sketch, taken from Müller's *Kosmische Physik*, of the Aurora Borealis in Norway, represents a beautiful aurora of this comb-shaped character. When the rays darted by the luminous arch are numerous and of great length, they culminate in a point which is situated in the prolongation of the dipping-needle, somewhat s.e. of the zenith. There they form what is called the *Boreal Crown*; and the whole heavens, towards the e., w., and n., present the appearance of a vast cupola of fire, supported by columns of variously colored light. When the rays are darted less brilliantly, the crown first disappears, then, here and there, the light becomes faint and intermittent, till at last the whole phenomenon fades from the sky.

The preceding description indicates the general features of the appearance of the Aurora Borealis; but several auroras have been described which presented striking peculiarities. Sometimes the phenomenon assumed the form of one or more curtains of light, depending from dingy clouds, whose folds were agitated to and fro, as if by the wind. Sometimes this curtain seemed to consist of

AURORA BOREALIS.

separate ribbons of light, arranged side by side in groups of different lengths, and attaining their greatest brilliancy at the lower edges.

The height of the aurora has been variously estimated. The first observers were inclined to place the seat of it beyond the atmosphere; but this hypothesis is untenable, as the aurora does not seem to be affected by the rotation of the earth, but appears to be in every respect a terrestrial phenomenon. By taking observations of the altitude of the highest point of the arch of the same aurora at different stations, heights varying from 5 to 500 m. have been calculated. The cause of these widely differing results may be found in the probability that exists of each observer seeing a different arch of the aurora for himself, and he is, in consequence, furnished with no comparable or reliable data for his calculations. It is now, however, generally admitted, on what are considered sufficient grounds, that the Aurora Borealis occurs at various heights, and that it is seldom found beyond 90 m. above the surface of the earth. The distance of the stations at which the same aurora has been visible indicates the enormous geographical extent, and likewise the great altitude, which the phenomenon frequently attains. One aurora, for instance—that which occurred 1839, Sept. 3, was seen in the Isle of Skye by M. de Saussure; at Paris, by the astronomers of the Observatory; at Asti, in northern Italy, by M. Quelet; at New Haven, Conn., by Mr. Herrick; and at New Orleans by credible observers. On the other hand, some observers of eminence assert that the aurora sometimes descends to the region of the clouds, and appears almost as a local phenomenon. Boscovich estimated the height at 825 m.; other observers have named a few hundred feet. Dr. Sophus Tromholt, who carried out a series of investigations on the subject of the Aurora Borealis in the extreme n. of Norway, affirms (in his book *Under the Rays of the Aurora Borealis*, 1885) that the height of those observed by him ranged from 62 to 124 m. It seems to be entirely untrue that the light of the aurora is ever serviceable to people in their work; its contribution to lighten the darkness is almost nil; the momentary flashes of real luminosity are very brief and of no practical value.

The noise that is alleged to accompany the Aurora Borealis in high latitudes would indicate for it a comparatively moderate height. Some of those who have heard it compare it to the noise produced by the rolling of one piece of silk upon another; and others to the sound of the wind blowing against the flame of a candle. In Siberia, it has been related that this noise sometimes resembles that attending the discharge of fireworks; and that the dogs of the hunters, when overtaken by such an aurora, lay themselves with terror on the ground.*

The intimate connection between the Aurora Borealis

* Arctic voyagers, such as Parry and Franklin, throw doubt on the existence of any such noise, for not one of the numerous and brilliant auroras seen by them was ever attended with the faintest sound.

AUROTELLURITE—AURUNGZEBE.

and the magnetism of the earth is shown by various facts. During the occurrence of the phenomenon the magnetic needle appears very much disturbed, sometimes deviating several degrees from its normal position, and appearing to be most affected when the aurora is brightest; and this oscillation is frequently perceived far beyond the district where the aurora is seen. The vertex, likewise, of the luminous arch is almost always found to be in or very near the magnetic meridian, and the boreal crown has its seat in the prolongation of the freely suspended needle. There seems, moreover, to be a connection between the magnetic poles of the earth in regard to the aurora, for, so far as has been ascertained, the meteor occurs simultaneously at both. The Aurora Borealis appears to be an electric discharge connected with magnetic disturbance. If one of Gassiot's vacuous tubes is brought near an electric machine, or between the poles of an induction coil, flashes of light pass between the ends, which bear a striking resemblance to the Aurora Borealis. A comparison of the spectra of the two goes far to establish identity. The auroral spectral line, according to Angström, is a yellow line near the sodium line, and is the same as the air line seen in the solar light when the sun is near the horizon. Other lines, however, have been seen, which cannot as yet be produced by the physicist from any known substance.

A line drawn through the s. of Spain to the n. of the Sandwich Islands, and through Cuba, approximately marks the s. limit of the Aurora Borealis (in the northern hemisphere); though occasional displays have been noticed further south. To the n. of a line passing through Edinburgh, the frequency of the Aurora Borealis rapidly increases, until a maximum is reached in a line through the n. of Spitzbergen, after which the frequency diminishes as the North Pole is approached.

AUROTELLURITE, n. *aw-rō-těł-lū'rīt* [L. *aurum*, gold; mod. L. *tellurium*, the metal so called: Gr. *lithos*, a stone]: a mineral, the same as Sylvanite.

AURUM: see GOLD.

AURUNGABAD, *ō-rŭn'ga-bād'*, or *Throne-town*: town in the territory of the Nizam; on the Doodna, a tributary of the Godavery. Its monuments of former grandeur are a palace, now in ruins, built by Aurungzebe, and the mausoleum of Aurungzebe's daughter. Pop. est. 60,000.

Other places in India are named Arungabad.

AURUNGZEBE, *ō-rŭng-zŭb'* (properly, Aurangzĭb, 'Ornament of the Throne'): most powerful of the Great Moguls, the last who ruled with energy and effect: 1618, Oct. 22—1707, Feb. 21. He was ten years old, when his grandfather died, and his father, Shah-Jehan, ascended the throne. A. early aspired to wield the rod of empire, but he craftily hid his designs beneath the cloak of piety. In 1657, his father, who had previously promoted him to high civil and military offices in the state, in which A. distinguished himself, was seized with an illness from which he was not expected to recover. The reins of power

AURUNGZEBE.

were at once seized by his eldest son, Dára, who treated his brothers very arbitrarily—Shujá at that time being governor of Bengal, A. of the Deccan, and Múrad of Guzerat. The first immediately took up arms. A.'s policy was to let the two fight it out, and exhaust each other, and then to play off his third brother against the victor. He conferred with Múrad; assured him he had no earthly ambition; that the crown he strove for was a spiritual, not a temporal one; and that, for affection's sake, and with a view to promote the interests of the true faith (Dára was liberal in his religious opinions, and had written a book to prove that Mohammed and Brahma agreed in all essential points) he would support his pretensions to the throne. Múrad believed him, and the forces of the two were joined. Meanwhile, Dára having overcome Shujá's army, directed his forces against his other two brothers; but A.'s plausibility prevailed over Dára's generals, who deserted, and Dára had to seek safety in flight. By this time, however, Shah-Jehan had somewhat recovered. A. professed the utmost loyalty, but secretly gave his son in



Aurungzebe.—From a Native Drawing.

structions to take possession of Shah-Jehan's palace, which was done, and the aged monarch was made prisoner. A. next seized and confined his too confiding brother, Múrad; and after a struggle of two or three years' duration, Dára and Shujá also fell into his power, and all three were put to death. The sceptre was now firmly within the grasp of Aurungzebe. He professed not to care for the imperial insignia, but was ultimately induced to receive them, 1678, Aug. 2. He, at the same time, assumed the presumptuous title of Alemgír, 'Conqueror of the World.' He also took the title of Mohi-eddin, 'the Reviver of Religion.' In the seventh year of A.'s reign, his father died, at a good old age; but there are suspicions, nevertheless, that his death was hastened by slow poison, administered by command of his son.

AUSABLE—AUSONIA.

A.'s long reign of half a century was distinguished by great outward prosperity; but the empire was diseased at its heart. Everywhere there was distrust; A., who had established his empire by fraud, was naturally distrusted by all. He lacked confidence in his statesmen, who, in their turn, distrusted him and one another. His sons imitated him in his disobedience to his father, and the Hindus, whom he treated with great harshness, excited the Mahrattas against him in the south. Still his great abilities sufficed during his reign not only to preserve his empire, but even to enlarge it. Discord between the monarchs of Bijapur and Golconda, due mainly to his policy when acting as governor of the Deccan, enabled him to add these two kingdoms to his empire. But the seeds of decay sown in his reign bore ample fruit in the reign of his son. The decadence of the Mogul empire dates from A.'s death, at Ahmednuggur, in the 89th year of his age, and 50th of his reign. The latter years of A.'s life were passed in misery. The memory of his own crimes weighed heavy on his soul. He lived in constant dread that he himself would receive of the measure which he had meted out to others. His court was remarkable among oriental courts for its economy and freedom from ostentation. A.'s character was not without its good features, as instanced by the fact that in the third year of his reign, when there was a great famine in the land, he gave unreservedly the funds of his treasury, which had been greatly augmented by his frugality, to procure food for his people.

AUSABLE, *aw-sâ'bl*: city of Iosco co., Mich., on the Detroit Bay City and Alpena railroad; 50 m. from Bay City. Principal industries: lumbering, salt-making, and fishing. There are two state banks, one with capital \$25,000, the other \$50,000, \$3,500 surplus, and \$8,500 undivided profits. Two weekly newspapers are published. Pop. (1900) 1,116.

AUSCULTATION, n. *aws'kŭl-tă'shŭn* [F. *auscultation*—from L. *auscultātiōnem*, a listening with attention—from L. *ausc'ula*, old form of *auric'ula*, dim. of *auris*, an ear]: mode of detecting diseases, especially of the heart and lungs, by listening to the sounds produced in the cavity of the chest. This is done either by the unassisted ear (*Immediate A.*) or by the aid of a simple sound-conveying instrument, the stethoscope (q.v.) (*Mediate A.*). By care and attention, the normal sounds produced by respiration and the beating of the heart may be distinguished from the several abnormal sounds indicating disease. A. is among the most important discoveries in modern medical science (see PERCUSSION). AUSCULTATORY, a. *aws-kŭl'tă-tēr'ĭ*, pertaining to hearing. AUS'CULTA'TOR, n. one who listens.

AUSONIA, n. *aw-sŏ'nĭ-a* [L. *Ausonia*—from *Ausones*, the inhabitants of *Ausona*, a town in Latium]: an ancient name of Italy; in *astron.*, an asteroid, the 63d found. It was discovered by De Gasparis, 1861, Feb. 11.

AUSPICE—AUSTEN.

AUSPICE, n. *aw'spĭs*, **AUSPICES**, n. plu. *aw'spĭs-ĕz* [**L.** *auspĭcem*, a diviner by birds: *auspĭciŭm*, augury from birds —from *avis*, a bird: *spĕcĕrĕ*, to inspect]: omens drawn from birds; influence; patronage and care; protection. See **AUGURIES**. **AUSPICATORY**, a. *aw'spĭ-ka-to-rĭ*, or **AUSPICIAL**, *aw-spĭsh'al*, a. pertaining to auspices. **AUSPICIOUS**, a. *aw-spĭsh'-ŭs*, having omens of success; prosperous; lucky; fortunate; favorable. **AUSPICIOUSLY**, ad. *-lĭ*. **AUSPICIOUSNESS**, n. *aw-spĭsh'ŭs-nĕs*, the prospect of a favorable issue.

AUSTEN, *awstĕn*, **JANE**: English novelist: 1775, Dec. 16—1817, July 18; b. Steventon, Hampshire, of which her father was rector. Her education was superior to that usually given to young ladies in the end of last century, and in her girlhood she was distinguished by good sense, sweetness of disposition, and personal attractions. From her childhood she wrote stories, but the first published were *Sense and Sensibility* (1811); *Pride and Prejudice* (1813); *Mansfield Park* (1814); and *Emma* (1816). These novels are remarkable for the truthfulness with which they portray the every-day life of the middle classes of England in her time, and for their delicate yet withal distinct discrimination of the various shades and peculiarities of character. Within their limits they are perfect, and exercise a singularly subtle charm over the reader. Sir Walter Scott says in his diary: 'That young lady had a talent for describing the involvements, feelings, and characters of ordinary life which is to me the most wonderful I have ever met with. The big bow-wow I can do myself like any one going; but the exquisite touch, which renders commonplace things and characters interesting from the truth of the description and the sentiment, is denied to me.' *Northanger Abbey* and *Persuasion* followed, with her name on the title-page, 1818, after her death, at Winchester. See her memoir by her nephew, J. E. Austen Leigh (2d ed. 1871), and a collection of her letters edited by Lord Brabourne (1884); also complete ed. of her novels (N. Y. 1892).

AUS'TEN, **WILLIAM**: English metal-worker and designer of the 15th c.; constructor of the famous tomb of Richard de Beauchamp, Earl of Warwick, in St. Mary's Church, Warwickshire.

AUSTERE—AUSTIN.

AUSTERE, a. *aw-stēr'* [F. *austère*—from L. *austērus*, rough : Gr. *austēros*—from *auō*, I dry up, I parch : It. *austero*]: severe ; harsh ; stern ; sour. **AUSTERE'LY**, ad. *-lī*. **AUSTERE'NESS**, n. roughness or harshness as in taste or conduct. **AUSTERITY**, n. *aws-tēr'ī-tī*, strictness in manners or life ; severity ; rigor ; harshness. **AUSTER'ITIES**, n. plu. *-ī-tīz*.—**SYN.** of 'austere': sour ; rough ; rigid ; harsh ; stern ; rigorous ; severe.

AUSTERLITZ, *aws'tēr-līts*: small town in Moravia, about 12 m. e.s.e. of Brünn; on the Littawa. It is celebrated chiefly as the place where Napoleon I., 1805, Dec., defeated the combined forces of Austria and Russia, under the command of their respective emperors. After the occupation of Vienna by the French, Napoleon fixed his headquarters at Brünn, and on this place the allied armies advanced. Their movements were ill conducted. The French army amounted to about 70,000 men ; while the allied armies numbered 95,000, of which 16,000 were cavalry. The battle began at seven on the morning of Dec. 2 ; and in this disastrous battle the allies lost 27,000 in killed, wounded, and prisoners, and the French 6,800. Pop. of A., 3,500.

AUS'TIN : city in Travis co. Tex., cap. of the state ; on the Colorado river, about 200 m. from Matagorda Bay, and 166 m. w. by n. of Houston ; on the Houston and Texas Central railroad. The city is finely located, about 40 ft. above the river. It contains many fine public buildings, including the capitol and general land office, a lunatic asylum, an asylum for the blind and one for the deaf and dumb. In 1890, an issue of \$1,400,000 in bonds was authorized to construct a dam 1,200 feet long, 60 ft. high across the Colorado river for a water supply and water power. It will create a lake 25 m. long by $\frac{1}{2}$ m. wide, and during the flood season it is estimated the flow of water over the dam will be nearly as great as over Niagara Falls. In this respect it is the most remarkable dam in the world. Austin has a sufficiently large and well-organized fire department. There are ten churches. The river is navigable for steamboats. The city in its amphitheatre of hills overlooks the valley of the Colorado. On a gentle elevation in the centre is Capitol Square, containing 20 acres, and here is the new Capitol, built of Burnet granite at a cost of \$3,000,000.

Austin is reached by a branch of the International and Great Northern railroad, and by the Texas Central and the Austin and Northwestern. It contains numerous educational institutions, including the Univ. of Texas, opened, 1883, Sept., free to young men and women on equal terms, being a part of the public-school system of the state. Here are also the Austin Female Institute, the Tillotson Collegiate and Normal Institute, enrolling 177 students in 1883, and the Texas Military Institute. The Texas Institution for the Deaf and Dumb (1901) 358 pupils and 32 instructors; the state appropriated nearly \$100,000 to the institution, whose grounds, buildings, etc., are valued at \$326,000. There were 26 white and 8 colored schools in 8

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school-houses, the city appropriation for the same being \$7,245. The total bonded debt 1901, Aug. 20, was \$1,633,000, assessed valuations (1900), real \$6,208,602, personal \$2,623,225, total \$8,831,837; banks (1902, Mar.), 5 national (cap. \$700,000, surplus \$106,086), and 1 private, periodicals (1902) 3 daily, 6 weekly, and 4 monthly. Pop. (1890) 14,575; (1900) 22,258. Since 1890 the area of the city has been increased about 7 sq. m.

AUSTIN, *avos'tin*: city of Minn., capital of Mower co., 101 m. s. of St. Paul. It has 8 churches, a court-house, 3 banks, of which 2 are national, a college, high and other schools, manufactures of flax, iron, railroad machinery, cement, etc.; also bottling and dye works, 3 flour-mills, and a planing-mill. Pop. (1900) 5,474.

AUSTIN, ALFRED: Eng. poet-laureate: b. Hcadingley, near Leeds, 1835, May 30. In 1853, he took his degree at the Univ. of London, and was called to the bar in 1857. His tendencies, however, were to literature rather than law, and he won distinction in journalistic work, becoming known as a vigorous critic and a racy polemic essayist. As a writer of poetry, Mr. A. has shown little original or creative power, but his verse is agreeable and well modulated, and he has written some very pleasing poems. His ardent tory advocacy naturally commended him to the premier, Lord Salisbury, and 1896, Jan. 1, he was appointed poet-laureate of England, as successor to Tennyson, who died Oct. 6, 1892.

AUSTIN, JANE (GOODWIN): author: 1831, Feb. 25—1894, Mar. 30; b. Worcester, Mass. She married L. H. Austin of Cambridge, Mass., making her home afterward in Concord and Boston. She died in Boston. Her books are chiefly colonial tales of the Mayflower pilgrims and their descendants, especially *Dea Darling* (1864); *Standish of Standish*; *Betty Alden*; *Dr. Le Baron and his Daughters*; and *David Alden's Daughter* (1892), her last publication.

AUSTIN, JOHN: distinguished English writer on jurisprudence; 1790, March 3—1859, Dec. At the age of 16, he entered the army, and served as a subaltern in Sicily. He left the service after the peace, and in 1818 was called to the bar. In 1820 he married Miss Sarah Taylor of Norwich (see AUSTIN, SARAH), to whom he had been attached for many years, and went to live in Queen Square, Westminster, next door to Jeremy Bentham and Mr. James Mill. He was compelled by bad health to abandon his practice at the bar, and he received the appointment of Prof. of Jurisprudence, in the newly founded Univ. of London. His lectures were well received by a few distinguished men; but the subject was not recognized as a necessary branch of legal study, and no provision was made for the Chair of Jurisprudence beyond class fees, and in the absence of students A., 1832, resigned his appointment. In the same year, he published his *Province of Jurisprudence Determined*, a work little appreciated by the general public, but entitling its author to the highest rank among writers on jurisprudence. In 1833, he was appointed by Lord Brougham, a member of the Criminal Law Commission, one of a class of bodies in whose efficacy he put

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no faith. 'If they would give me £200 a year,' he said, 'for two years, I would shut myself up in a garret and at the end of that time I would produce a complete map of the whole field of crime and a draft of a criminal code.' These, he thought, a commission might with some profit revise and amend. A. was afterwards appointed a member of a commission to inquire into the grievances of the Maltese. He returned to England in 1838, not in good health, and was advised to try the springs at Carlsbad. With his slender means, decent existence in England was scarcely possible, and he removed with his family to Germany. The revolution of 1848 drove him back to England, and he settled at Weybridge, where he died, widely respected for the dignity of his character. His lectures on the principles of jurisprudence, in manuscript and imperfect, were prepared for the press by his widow, and published 1861-63, under the title of *Lectures on Jurisprudence, being a Sequel to 'The Province of Jurisprudence Determined,' etc.* On this work rests his enduring fame.

A.'s great merit consists in his having been the first English writer who attached precise and intelligible meaning to the terms which denote the leading conceptions underlying all systems of jurisprudence. With a profound knowledge of the methods of Roman and English law, he showed genius of the highest order in devising a novel system of classification for the subject-matter of his science. His work is incomplete, but it forms a sure foundation to future laborers. He set himself to the task of exposing the errors hid under the phrases and metaphors current among writers on law, and his skill and subtlety in this make his works models of close and sound reasoning. In education, they now perform a most important part—disciplining the mind of students of law in the difficult art of precise thought. See Memoir of A. prefixed to the *Lectures on Jurisprudence*, and an article on A. in J. S. Mill's *Dissertations and Discussions*.

AUSTIN, *aws'tin*, JONATHAN LORING: patriot: 1748, Jan. 2—1826, May 10; b. Boston. He graduated from Harvard College 1766, engaged in mercantile business in N. H., entered the patriot army as major, and soon became aide to Gen. Sullivan. He carried dispatches to France 1777, and remained till the spring of 1779 as Dr. Franklin's private sec. He was sent on another mission to Europe by the state of Mass. 1780, was taken prisoner, but was soon liberated. He was afterward state treasurer and sec. of state, and for several terms a member of the state senate. He died at Boston.

AUSTIN, SARAH (TAYLOR): translator of many of the best contemporary French and German works: 1793-1867, Aug 8; b. Norwich, England: wife of John A. (q.v.), whom she married 1820. She was of a family noted for literary ability. Mrs. A. translated from the German *Characteristics of Goethe*, by Falk, etc., with notes (1833); *Fragments from the German Prose Writers*, with notes (1841); and *The Story without an End*, by F. W. Carove (several editions). She also translated from the German, Ranke's *Popes of Rome* and his *History of Germany during*

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the Reformation. Mrs. A. translated from the French M. Cousin's *Report on Public Education in Prussia* (1834), and M. Guizot's work on *The English Revolution* (1850). She published, 1839, a work *On National Education*; and in 1857, *Letters on Girls' Schools and on the Training of Working-women*. From 1861 to 1863, she was engaged in editing her husband's lectures from his manuscripts, in which, as in all her work, great ability is shown.

AUS'TIN, STEPHEN F.: Texan pioneer: about 1790-1836, Dec. 27; son of Moses A., of Conn. The father had obtained a grant of land from Mexico, with the intention of planting a colony there, but died before his plan was accomplished. The son gathered a company of followers in New Orleans about 1821, and led them to the present location of the city of Austin. A year or two later, he secured from the Mexican govt. all the privileges which had been granted to his father. He was a skilful manager, and soon had a prosperous colony and a large area of excellent land. He not only kept the assoc. intact, but also dispersed the hostile Indians. Dissatisfaction with Mexican rule led 1833 to the formation of a constitution, which the govt. refused to ratify. A. was finally imprisoned, but was liberated 1835, and became commander-in-chief of the revolutionary forces. He was appointed commissioner 1835 to the U. S. govt., to obtain its recognition, and was succeeded in command of the army by Gen. Sam. Houston. Though he presented the case of his colony wisely and forcibly, he did not have the proper credentials, and his mission to Washington proved fruitless. He returned 1836, July, and renewed his efforts in behalf of the colony, but did not live to see its independence secured.

AUSTIN CANONS: see AUGUSTINS.

AUSTRAL, a. *aws'trāl* [F. *austral*—from L. *austrālis*, southern—from *auster*, the south wind: It. *australe*]: pertaining to the south. AUS'TRINE, a. *-trĭn*, southern. AUSTRALASIAN, a. *aws'trāl-ā'shan* [L. *austrālis*, and *Asia*]: pertaining to Australasia. AUSTRALIAN, a. *aws-trā'lē-ăn*, pertaining to Australia. AUSTRALINE, n. *aws'trā-lĭn*, the variety of oil of turpentine obtained from the *Pinus austrālis*, or *P. palustris*, ord. *Conif'erae*; the liquid called *austraterebin'thēne*, produced by neutralizing turpentine oil with an alkaline carbonate, which is then treated to a process of distillation.

AUSTRALASIA, *aws'trāl-ā'shĭ-a*: a term etymologically equal to *Southern Asia*, but generally used to indicate Australia and the neighboring islands, mainly Tasmania, New Zealand, Papua or New Guinea, New Caledonia, New Hebrides, New Ireland, and New Britain. The term would thus exclude the Malay Archipelago, Micronesia, and Polynesia proper; but some authors use A. so as to include these great groups of islands also, making the name therefore equivalent to *Oceania*. The former seems the more convenient usage. For the several islands, see the various titles. The term A. is now used often and properly to denote the colonies of Great Britain in those southern seas.

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AUSTRALIA, *avos-trā'li-a* : by far the largest island of the Australasian group, and for extent describable as a continent, is in the form of a rectangle, though with some projections on the n. and s. sides; between $10^{\circ} 39'$ and $39^{\circ} 14'$ s. lat., and between 113° and $153^{\circ} 16'$ e. long.; having a maximum length, from w. to e. (from Dick Hartog's Point to Point Cartwright), of about 2,400 m.; and a maximum breadth, from n. to s. (from Cape York to Wilson's Promontory), of 1,971 m.; 2,996,030 sq. m., about one fifth less than that of Europe, or more than twenty-six times that of Great Britain and Ireland. Its nearest point is separated from England by about 11,000 m. On the n. it is separated from New Guinea by Torres Strait, 90 m. broad, and the Arafura Sea, and from the Sunda Islands by the Indian Ocean; on the w. it is washed by the Indian Ocean; on the s. it is bounded by the Indian Ocean, and divided from Tasmania by Bass Strait, 140 m. wide; on the e. it is washed by the s. Pacific Ocean. This island-continent is, above all other continents, exceedingly compact, with an almost unbroken seaboard on the e. and w., which, notwithstanding, offers some good harbors on both these sides. Parallel with the e. coast, at a distance of about 60 m., stretches for 1,200 m. the Great Barrier Reef, offering but one safe opening for ships.

The sea encircling A. is, on the whole, remarkably shallow, especially on the n.; and, except on the s.e., reaches to a depth of only some 200 fathoms. At a distance of from 300 to 500 m. however, on the e., s., and w. coast, a depth of 15,000 ft. is attained. Bass Strait is rather dangerous for navigation.

Of rivers communicating between the coast and the interior, there are remarkably few. The mountains rising to any great elevation are all on the e. side; and there is but one great river, the Murray, collecting into itself (by the Darling and other great tributaries) almost the whole w. drainage of that e. range. The few straggling series of mountains on the w. side of the continent feed but a few short intermittent streams, and nearly the whole vast expanse, between that narrow, partially knotted selvage on the w., and the Murray Country (Queensland, New South Wales, Victoria, and the e. slip of South A.) on the e., is but a slightly relieved barren desert. The lack of natural irrigation over this arid area is aggravated by the enormous evaporation, which, for long periods, more or less dries up what rivers it possesses.

The eastern highlands of A., running parallel with the coast for some 1,700 m., now in a series of ranges, and now in a single chain or series of detached hills, are continued into New South Wales by the Warragong, or Australian Alps, where in Mount Kosciusko (7,308 ft.) the continent attains its highest elevation. Thence upland valleys merge northward into the Blue Mountains, which send offshoots toward the Liverpool Range, that, sweeping e. and w., curve round the s. edge of the lovely Liverpool Plains. The main chain skirting the e. of New England, runs n. to the frontiers of Queensland, where it branches into an e. arm, the Macpherson Range; and a w. arm, the

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Herries Range. Inclosing the w. valley of the Brisbane river, and sinking northward to the valley of the Burnett, is the Dividing Range of Queensland, from whose w. side slope the Darling Downs. To the n. of the Brisbane and Condamine rivers, the highlands expand to their greatest breadth, but contract again to the n. of the Fitzroy river into a comparatively narrow chain, which sinks into the depression of the valley of the Burdekin. N. of this river, uplands, with an average elevation of 2,500 ft., again start n., terminating at 17° s. lat. In S. A., the Lofty Range skirts the e. of St. Vincent Gulf, and the Flinders Range the e. of Spencer Gulf and Lake Torrens.

Almost the whole of this vast region to the south-east of A. (the eastern part of South A., Victoria, New South Wales, and Queensland) is drained by the Murray and its tributaries, whose arterial system has an area of about half a million miles, as large as the Austrian empire. The Murray, rising in the Australian Alps, flows between Victoria and New South Wales, then through S. A., discharging, after a course of 2,400 m., into Alexandrina Lake. On its s. or left bank, it receives all the n. streams from the mountains of Victoria, the principal of which are the Goulburn and Loddon. On its n. or right bank, it receives all the s.w. rivers from the e. highlands, the principal being the Murrumbidgee (1,350 m. long), which also rises in the Australian Alps, and collects the waters of the Lachlan; and farther w. the Darling (1,160 m.) which has for its tributaries the Barwan, Culgoa, and Warrego. N. of the Murray, the two most important rivers are the Fitzroy, and the Burdekin in Queensland. The other rivers to the e. of the e. highlands are short and rapid, unfit for navigation. All those hilly and partially river lands consist of grassy park-like uplands, clothed with scattered thin forests of magnificent trees, for the most part evergreen and vertical-leaved, diversified by bush and heath and scrub; all of excellent pasture, intersected by wide valleys of remarkable fertility well adapted for agriculture.

From the head of the Gulf of Carpentaria stretches a table-land westward along the border of the Gulf and the base of Arnhem Land, then s.w. along the coast, pierced by the Flinders river, the deep valley of the Alligator, the Roper, and the Victoria; the two latter navigable for a considerable length, and flowing through fertile lands and picturesque scenery.

West A., toward the coast, is in its n. half crossed by ranges, running mostly e. and w., of detached mountains, intersected by the fertile valleys of Ashburton, Gascoyne, and Upper Murchison. In its s. half, West A. is for the most part a barren tract of salt or mud steppes, almost destitute of fresh water, and extensively overgrown with dreary thickets. In the s. it is pierced by the Upper Swan river and the Blackwood. On the s. coast, from King George's Sound to Spencer Gulf, is neither mountain nor river.

To the n. of Spencer Gulf is an area of abt. 1,000 sq. m., 'the Lake District' of A., set with lakes not deficient in number; Torrens, straight to the n. of Spencer Gulf, over

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100 m. long, with Eyre to the n. of it much larger, and Gairdner to the w. of it. To the e. of Eyre are Lakes Blanche and Gregory; and far to the northwest, Lake Amadeus. These dead masses of salt water fluctuate greatly in body as the season is dry or rainy, now sheets of water, and now almost grassy plains, set in the dreariest wide-spreading steppes. A comparatively verdant belt of country lies to the e. of this district, and runs to the extreme n. as the axis of A., along the telegraph line.

The whole interior of the country, with the exception of this axis-like belt, measuring about 1,500,000 sq. m., presents one vast dreary plain, sometimes of stifling, scorching, low-lying, deep-red sand-ridges; sometimes matted over for hundreds and thousands of miles with 'scrub,' a species of eucalyptus, growing to a height of 8 to 10 ft., occasionally higher—either the 'mallee,' a hard, dreary, sapless shrub, thickets of which are almost impenetrable, or worse still, the 'mulga.' Worst of all, however, is the 'spinifex' or 'porcupine grass,' lacerating the feet of horses and the clothes and flesh of men; a grass, which in one district alone, to the n. and n.w. of Lake Eyre, overspreads 10 degrees of latitude. To the e. of the central telegraph line, as far as to the w. plains of Queensland, is an unknown country, supposed to be sandy or otherwise uninhabitable.

Discovery and Settlement.—The earliest trace of A. in human records is found in a French chart of 1542, where it figures as 'Jave la Grand.' It is next distinctly referred to in a book by Cornelius Wytfliet (Louvain, 1598), in which it is conjectured to measure one-fifth of the world. The present Torres Strait refers to the presence of Torres there in 1606. Dick Hartog's Island in the west carries us back to Dick Hartog and the year 1616. Arnheim Peninsula is a reminiscence of the Dutch vessel *Arnhem*, which, 1618, explored the coast of that land. The Dutch ship, *Guldene Zeepard*, 1627, sighted a large part of the s. coast from Cape Leeuwin eastwards. The Gulf of Carpentaria is the memorial of General Carpentier's visit to those waters in 1628. In 1688, this land was first seen by British eyes (so far as now known) in the person of Dampier, who names an archipelago in the n.w. Nearly a century later (1770) Captain Cook, on his course of circumnavigation of the globe, explored the whole eastern coast from Gipps Land on the s.e. (in Victoria) to Cape York. This expedition stayed a week in 'Botany' Bay, while Sir Joseph Banks and Dr. Solander were collecting some thousand species of the wonders of Australian botany to show at home. Bass Strait, on the s., refers to a time twenty years later (1790), when Mr. Surgeon Bass was there with Lieutenant Flinders. In 1792, Flinders (who names a range of hills in South A., and a river in the north, discharging into Carpentaria) was surveying Moreton Bay and Hervey Bay; in 1801, Spencer Gulf and the Gulf of St. Vincent, and the coast on the e. and n. In 1800, Captain Grant, in 1802, Lieutenant Murray, surveyed Victoria; the latter discovering the bay of Port Philip, at the head of which now stands Melbourne. The exploration of the

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whole coast was completed by the *Beagle* (in which Charles Darwin sailed), 1837-43.

The first British settlement having been made, 1788, at Port Jackson (on which Sydney now stands), inland exploration necessarily followed; but for the first 25 years was confined inside the Blue Mountains, to a district of some 50 m. in diameter. In 1813, however, that barrier was passed over, and the Fish river and Bathurst Plains were for the first time brought within the limits of civilization. Two years later (1815), the Lachlan river (tributary of the Murrumbidgee) was discovered, and traced 300 m. in a s.w. direction to a 'marsh.' Next the Macquarie (tributary of the Darling) was discovered, and followed likewise to a 'marsh'—experiences which suggested the theory of a sea in the interior of A. Mr. Oxley pushed exploration through New South Wales into Queensland, laying open the Brisbane river. In 1819, Hamilton Hume unveiled the Murrumbidgee; and in 1824, the Murray, thence traversing the country s. to Port Philip. Captain Sturt and he next followed the Macquarie to the Darling, and made known the junction of the Darling and Murray; then sailed down the Murray to its discharge into Alexandrina Lake. Major Mitchell tracked the Lachlan through the 'marshes,' discovered (1835) the Loddon (tributary of the Murray) and Wimmera (intermittent stream to w. of it), crossed the Grampians, descended the Goulburn to the Murray, and altogether surveyed the fairest and richest part of Victoria, 'Australia Felix,' as he admiringly named it. In 1839, Mr. Eyre (of the 'Jamaica massacre') discovered Lake Torrens (in South A.); and in 1840, after exploring its e. shores, and the Flinders Range to the s., accomplished a successful but most perilous and distressing march of 1,209 m. from Adelaide to King George's Sound. In 1844-5, Captain Sturt started from the Darling (130 m. above its confluence with the Murray), travelled 250 m. n.w., then n. to the Grey Ranges, over endless deep red sand-ridges, over a barren mud-plain, through 'Spinifex' (spiny lacerating 'porcupine grass'), to the margin of the blank of A., a 'terrible' country. In 1843-46, Leichardt explored Queensland from the s. borders to the Gulf of Carpentaria. In 1844, he crossed from Fitzroy river to the head of the Gulf of Carpentaria, whence he made his way w. along the n. coast as far as Port Essington. The next great successful feat (one of the greatest and most successful of all Australian explorations) was the passage across the whole continent, from s. to n., from Adelaide to a point w. of Chambers Bay, 1862, by M'Douall Stuart; opening the Albert river, the Finke river, the Macdonnell Ranges, the Ashburton Ranges, etc., altogether a quite practicable route across the continent through a fairly continuous, though narrow belt of upland and stream, a route utilized in 1872 for a telegraph line, with fixed stations. About the same time with this fortunate expedition, falls the most tragic one of Burke and Wills. Starting from Melbourne, these two explorers reached Cooper's Creek, the lower course of the interior Barcoo river. There, leaving the larger portion of their

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cumbrous cavalcade, Burke and Wills pushed on, passing the M'Kinlay Mountains, and reaching the Gulf of Carpentaria, near the mouth of the Flinders, the first passage made across the continent. On their return journey, they perished miserably of starvation at Cooper's Creek. M'Kinlay, sent in search of the lost party, traversed the whole continent to Albert river, thence e. to Burdekin river and Port Denison. In 1861, F. F. Gregory explored 800 m. of the n.w. of A., at a distance of some 200 m. from the coast along the upper courses of the De Grey, Ashburton, Fortescue, and Oakover. The w. side of York Peninsula was explored by Jardine, 1864. The telegraph line of 1872, as a base or goal of adventure to or from the w. coast, could not but provoke expeditions to draw communicating lines between it and the w. coast. Accordingly, in 1872, Ernest Giles started from Chambers Pillar, near the Charlotte Waters telegraph station; but in spite of the most stubborn resolution, reached only 100 m. to the n. of Lake Amadeus. In 1873-4, starting 200 m. farther s. he reached half-way across to the w. coast. In 1873, however, Colonel Warburton, starting in April from Alice Springs (just n. of the tropic), arrived in Dec. of that year at Oakover river in Western A. In 1874, Forrest passed from Murchison river on the w. coast, to the telegraph line a little to the n. of Peake Station. In 1875, Giles crossed from the head of St. Vincent Gulf to Perth on the w. coast, having traversed 2,500 m. through a wholly unavailable country, for 1,000 m. of which he had to bore his way through interminable scrub. These expeditions demonstrated that the interior of A., between the w. of the Murray Country and the strip of elevated coastland to its n. and the e. of the narrow hilly border of Western A. was all little better than one hopeless desert, either unmitigated sand or vast frightful mattings of scrub or porcupine grass, the one considerable exception being the strip of the central telegraph line; and that, altogether, there was nearly a half of the continent which defied being made anything of.

The first civilized settlement in A. was at Botany Bay, 1788, by 1,030 persons, mostly convicts. In 1825, Moreton Bay (now Queensland) was settled as a part of New South Wales, attaining, 1859, Dec., the position of a separate colony. The settlement of Western A. (the Swan River Settlement, as it was then called) dates from 1829. It continued to be a penal settlement, 1851-68. Port Phillip (now Victoria), then a part of New South Wales, was first colonized 1835, and 1851, July 1, was constituted an independent colony. The colonization of South A. by British emigrants dates from 1836. A large proportion, it may be noticed, of the geographical nomenclature of A. is Scotch.

Geology.—The surface of A. rests on strata for the most part of palæozoic and cainozoic or tertiary formations, though mesozoic or secondary deposits also have of late been laid open in various quarters. In Victoria, the Grampians and Pyrenees (with the Ballarat gold-fields to the s.) in the s.w., the great Dividing Range running s.e.

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and n.w. about the centre; the Warragong or Australian Alps in the n.e., and projecting into New South Wales; in New South Wales, the Blue Mountains; and in Queensland, the Dividing Range, are all mainly of Silurian formation, broken, however, by intrusive igneous rocks of granite, syenite, and porphyry. The same Silurian formation largely pervades South A., running in a broad diagonal from the s.e. coast, n.w. across the whole province. Though traps and granites occupy a large area to the s. and w. of Western A., traces of palæozoic formations are found in the Darling Range. No carboniferous rocks are known in South and West A. Detached sprinklings of metamorphic rocks occur in Queensland, along the central line of the continent from Ashburton to the Macdonnell ranges, and in the n.w. of Arnhem Land. The older settlements of New South Wales, including the coal-field of the Hunter river, rest on sandstone. Carboniferous strata, abounding in fine coal, and containing fossils of fish, corals, zoophytes, sigillaria, calamites, etc., extend over 50,000 sq. m. of Queensland, between 29° and 15° s. lat. The tin-mines of Queensland are imbedded in granite, rising through the carboniferous rock. Sandstone and limestone, of carboniferous or Permian formation, are in the s.e. of Victoria; and the two southern peninsulas of this province consist largely of limestone and carbonaceous deposits of mesozoic age. The secondary formation lies principally, however, in Queensland, where a cretaceous bed, having fossils of belemnites, ammonites, plesiosaurs, and ichthyosaurs, extends for about 200,000 sq. m., from near the Gulf of Carpentaria to the s. of the Darling river. The valley of the Wannon (which runs into the Glenelg river) is mesozoic, as is also the coal deposit of Parramatta to the s. of Sydney. The Clarence river, to the n. of New South Wales, runs through Trias.

Tertiary deposits, mostly pliocene, it is supposed, occupy an immense area of A., comprehending the desert sandstone, the coral limestone, and a large part of the conglomerates and clays of the gold-diggings. Western A., to the e. of the unstratified area, rests on desert sandstone, which also stretches n. and e. far into the interior, taking in likewise all South A. outside the diagonal Silurian bed above mentioned, penetrating into the interior plains of Victoria and New South Wales, and skirting the e. edge of the cretaceous strata of Queensland.

Quaternary deposits, forming 'flats' in the gold districts, occur in the Upper Macquarie and Upper Murrumbidgee rivers. These, with clay-deposits in the Liverpool Plains and Darling Downs of New South Wales, have yielded some very interesting fossils throwing light on the past fauna of A. A kangaroo, for example, has been found one-third larger than any kangaroo of the present times; also, a nototherium (an animal between the wombat and kangaroo) as large as a rhinoceros. Remains have been discovered also of a bird, named by Prof. Owen *dromornis*, larger than an ostrich, kindred to the now existing emu and cassowary.

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Though there are no active, yet there are many extinct volcanoes in A. In South A., in Mount Gambier, are a large group which have broken through the horizontal coral beds, and whose craters now present beautiful lakes. In Victoria, a large part of the soil is basaltic, the débris of volcanoes of all periods, from the primary to the tertiary. Looking from any high eminence in the neighbourhood of Ballarat, you may count extinct volcanoes by the score, some nearly closed up; but others having rims of some miles in circumference, from a few feet to 100 ft. deep, some rising 2,000 ft. above the sea.

The tertiary gold-drifts of A. extend through four epochs: the 'oldest,' 'older,' 'recent,' and 'most recent,' all belonging to the lower Silurian strata (the 'bottom,' or 'rock-drift,' as the miners call it); and contain the reefs or auriferous quartz from which the gold is extracted by crushing and amalgamation; the pure gold averaging about $\frac{1}{2}$ oz., but sometimes amounting to $3\frac{1}{2}$ oz., per ton. The miners are employed on drifts mostly of 200 to 500 ft. deep, at the bottom of which, in the 'gutters' (leads, or old river-beds), the precious metal is found. The 'oldest' drifts occur in patches, capping the Silurian heights. In the valley, above the first lava flow (which rests immediately on the Silurian bed-rock), is the 'older' drift. Above that is another lava flow, covered by the 'recent' drift; then over that, another lava flow, on which rests the 'most recent' drift.

The abundance of palæozoic deposits in the e. of A. suggests a great extension of land in that direction to supply the plants which their dimensions presuppose; and the Great Coral Reef along the e. coast indicates land which, it may be supposed, at one time formed part of the continent: similarly the shallow seas and numerous islands to the n. seem to indicate an ancient conjunction of A. with Asia. The abundance of mammalia entirely isolated from those of all other lands, the evidence that the strata of A. give of their greater opulence and no less uniqueness in the past than now, with the testimony of all other departments, all demonstrate the existence, during the tertiary epoch, of a much more fertile continent than the A. of the present age, and comprising lands now sunk beneath the sea. The flora of West A., so peculiar and so singularly rich, and its affinity in some degree with the flora of s. Africa, may point to a western extension of A. The islands of St. Paul and Amsterdam, lying between A. and the Cape, suggest to Mr. A. R. Wallace the relic of a past line of communication between the two lands.

Minerals.—Gold is distributed more or less through all the Australian colonies, but principally in Victoria, Queensland, and New South Wales. Diamonds and other precious stones have been found in different parts of the continent. The carboniferous strata of New South Wales, extending over a vast area, are very rich in coal, the coal-fields of that colony being among the most extensive in the world, containing also cannel coal and mineral oils.

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The whole basin of the Hunter river, with its tributaries, down to Newcastle on the sea-coast, abounds in true coal of palæozoic age. Coal is found also at Cape Otway, and Western Port in Victoria, but belongs to the mesozoic formation, and is not of great value. In the s. of Queensland is an oolitic coal-field. Palæozoic coal, of great extent and great prospective value, has been discovered in the central regions of that colony, along the basins of the Mackenzie and Dawson rivers; while near Brisbane and the upper courses of the Darling Downs rivers, almost equally extensive and valuable beds of coal of mesozoic age have been found. Rich copper-mines have been opened in the palæozoic limestones of South A. They were discovered first near Adelaide. The most important mine, however, is that of Burra-Burra, 90 m. to the n., discovered 1842. A still more extensive deposit of copper-ore lies at Wollaroo, at the n. end of York Peninsula. In all, nearly 30 copper-mines have been opened in South A. Silver-lead has been worked near Cape Jervis (s. point of peninsula w. of Alexandrina Lake), and bismuth in the mountains of the Lofty Range to the e. of Adelaide. Lead exists largely in West A., over 2,000 tons of it having been exported from that colony in 1876. Iron exists in large masses in West and South A., but in neither of these colonies has coal been found to work it. Very valuable tin-mines have been opened in Queensland, especially in the neighborhood of the Wild river, and n. of New South Wales.

Climate.—In proportion to its size, A., lying mostly within the temperate zone, has a singularly equable climate; in general, hot and dry, and remarkably salubrious. Within the tropics, it has its rainy season in summer (Nov. to Apr.); s. of the tropics, almost exclusively in winter. The principal mountains, both for extent and height, lying to the e. or windward side, absorb by far the heaviest tribute of moisture brought by the winds from the Pacific; and, as a rule, the amount of rainfall on the e. side is in inverse proportion to the distance from the e. coast. The w. side has far less rain than the e., and there the rainfall is proportionate to the proximity to the w. coast. Thus, Sydney has a mean of some 50 inches rain in a year, while Bathurst, 96 m. from the sea, gets only 23 inches; Deniliquin (287 m. removed) 20 inches, and Wentworth (476 m.) but 14 inches. Melbourne and Adelaide in the s. receive respectively 25 and 20 inches. The Queensland coast receives from 40 to 80 inches; the w. getting proportionately less. The elevated lands of West A. have about 30 inches rainfall. What moisture is left in the winds after their passage across the highlands, the intense heat rising from the central plains tends to dissipate instead of allowing it to condense into rain. The parched traveller over those arid deserts looks up again and again into gathering clouds which argue possibility of rain, but never come to rain. South A., Victoria, and in a less degree, New South Wales, are exposed to winds from the interior likened to the ‘blast of a furnace,

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instantly raising the temperature of the lands they visit to as high as 115° or higher, and sometimes producing extensive bush fires. Melbourne has a mean temperature of 58° ; Sydney, 63° ; Adelaide, a little higher; Perth, about the same as Sydney. Captain Sturt found the mean temperature of the interior for three months over 101° F. in the shade, and the drought such as to unloosen the screws of his boxes, split his combs into thin laminæ, make the leads drop out of his pencils, and his finger-nails become brittle as glass. The e. highlands have a greater proportion of snow than their latitude and height would argue. At 5,000 ft. high, in certain situations, snow remains all the year, and many of the higher mountains are covered with snow all the winter. One instance of snow is chronicled at Sydney for 1836, June 28. The worst feature in the climate of A. is the total uncertainty and inequality of the rainfall in all parts of the continent, menacing the whole country with almost equally distressing alternations of drought and flood. Droughts sometimes completely wither up vegetation over large tracts of land, to the destruction of many thousands of cattle; that of 1884 was said to have destroyed 10,000,000 sheep. On the coast of New South Wales, for instance, hardly any rain fell in 1814-15; and again in 1827-8-9. The ordinary drought itself renders almost all the rivers of A., with the exception of the Murray proper, merely intermittent; shrunk for months together into straggling puddles, with or without some connecting thread of water. As *rivers*, they really cease to exist for a longer or shorter period every year. Even the Murray proper, which, in any case, dwindles every summer into meagre proportions, dried up, in the drought, 1838, Jul.—1839, Aug., into a concatenation of pools. The rainy season, on the other hand, swells these pools into terrific floods, inundating the country, and often destroying property. The caprices of Australian drought and flood are well illustrated by the metamorphoses of Lake George, 25 m. to the s.w. of Goulburn, and having an elevation of 2,260 ft. above the sea. In 1824, Lake George was a sheet of water, 20 m. long, by 8 m. broad; in 1837, a grassy plain; in 1865, it was 17 ft. deep; in 1867, 2 ft. deep; in 1876, 20 m. long and 20 ft. deep. If only the weather could, within any approximate degree, be calculated on, there are, no doubt, many tracts in the interior which could be utilized.

Botany.—The vegetation of A. is altogether unique, standing at a long interval from that of all other quarters of the globe, but is exceedingly abundant in species. These, it is calculated, number about 10,000, of which 8,000 have been already determined; considerably more than are to be found in all Europe. A peculiarity of the trees covering its seaboard highlands is their uniform sombre olive shade, alike on upper and under surface; and the generally vertical direction of their foliage, which thus allows much freer entrance to the blazing summer sun. Another peculiarity of Australian vegetation is the ‘scrub’—the ‘mallee,’ ‘mulga,’ and ‘porcupine grass.’ above referred to—which is the chief

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matting of the desert, presenting a cheerless prospect, perhaps not one tree within visible distance, and scarcely a bird to be descried overhead in flight. There is one agreeable 'scrub' formed by the tea-tree, a flowering shrub, a species of melaleuca, abounding in all parts of A.; not so dense as the 'mallee,' and mingled with other flowering plants. Next is the 'heath,' composed of a dwarf shrub 2 ft. high, clothing tracts boggy in winter and dusty in summer, mingled with bushes of melaleuca and banksia (or 'native honeysuckle'), all bright colored and aromatic. Highlands are rich in wood, such as that of the gum-trees of the genus eucalyptus, growing to a height of 250 ft., with a girth of 12 to 20 ft. In the Dandenong Range, 40 m. e. of Melbourne, are many trees over 420 ft. high; one felled giant measuring 480 ft. Then in the s. and w., and even a little into the interior, though less abundantly there, are the valuable shea-oaks, beef-woods, or casuarines—leafless trees, with rigid drooping branchlets something like our 'horsetails,' their wood the color of beef (whence the name) and as good as oak. Grass-tree (xanthorrea) shoots up into a rugged stem, varying in height from 2 to 10 ft., is surmounted by a tuft of wire-like drooping foliage, from the centre of which rises a spike like a bulrush, flowering in winter into white stars. The 'wattles' or acacias, abounding everywhere in the country, and comprising 300 species, are also a most characteristic and grateful feature of A., with lovely yellow blossoms, generally fragrant. Australian bush is fragrant all the year. The traveller in the highlands of New South Wales, will not unfrequently light, in some sheltered valley or deep ravine, on a scene of luxuriant vegetation, such as that of Illawarra, 50 m. to the s. of Sydney, where palms rising to 70 or 100 ft., Indian figs draped with strange parasites, creepers, ferns, etc., and the loftiest trees, all are intermingled into a labyrinth of the most graceful forms and brilliant colors. The 'flame-tree,' with its clusters of red flowers, gives signal of the Illawarra Mountains to ships miles out at sea. The 'fire-tree' of West A., the only non-parasitical plant of the same order as our mistletoe, flames with orange-colored blossoms like a tree on fire. The *Stenocarpus Cunninghami* of Queensland presents one mass 50 ft. high of orange-tipped crimson stamens. The 'warratah' of New South Wales shows a single stem of 6 ft. supporting a crimson blossom, like a full-grown peony. The Alpine vegetation of the higher mountains in Victoria and New South Wales intermingles the ranunculus, geum, gentiana, gaultheria, etc., analogous to the Alpine plants of Europe, with the purely Australian oxylobium, brachycome, acacia, hovea, and bossiæa.

Zoology.—Zoology of A. is more peculiar than its botany. Mammalia of other lands are totally wanting here. Marsupials or pouch-bearing mammalia of A. have but opossums of America to represent them in other parts of world. There are 'no apes, oxen, antelopes, elephants,

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rhinoceroses, or pigs; no cats, wolves, or bears; none even of the smaller civets or weasels; no hedgehogs or shrews; no hares, squirrels, porcupine, or dormice; only some peculiar species of rats and mice, and the 'dingo,' a wild dog. The largest of the marsupials is the kangaroo, attaining a height of 5 ft., and a weight of 200 lbs. Smaller species are the wallaby, the hare kangaroo, and rat kangaroo. The fruit-eating bat, or flying fox, is found in New South Wales and Queensland. The shores of A. are frequented by Antarctic-like seals and sea-lions; and on the coast of Queensland is the dugong or sea cow. Then there are phalangers—nocturnal animals, feeding on leaves, and living in the hollows of trees. In the moonlight stillness of the forest, flying opossums may be seen gliding through the air. The flying-mouse, 'able to sleep in a good-sized pill-box,' is decidedly Australian. The tarsipes of West A. is a honey-sucker, no larger than a mouse, with extensile tongue. The koala of the e. districts is 2 ft. long, thick-limbed, and tailless. The wombat, the largest of the marsupials, next to the kangaroo, is 3 ft. long, feeds on roots and grass, burrowing deep in the ground, and is nocturnal. The 'native cats' are carnivorous marsupials, variously marked and spotted, but fierce and intractable, dwelling among rocks and in holes, and feeding on small mammals and birds. The ant-eater of West A. is of the size of a squirrel, beautifully white-striped, with long and rather bushy tail. It has 52 teeth, a greater number than in any other known quadruped, and feeds on ants. The platypus, having no teeth nor marsupial pouch, and inhabiting the rivers and lagoons of the s. and e. of A., is 20 inches long, having very short legs, and broad-webbed feet. From its flat head projects two flat horny jaws, like the bill of a duck.

The birds, though not quite so unique and strange a feature of A. as are its other mammalia, excel those of all other temperate lands for beauty of plumage and fineness of form. Passing over the splendid parrots and cockatoos, we note for their singularity of figure, or brilliancy of feather, the regent-bird, rifle-bird, fly-catcher, and lyre-bird. The abundant flora, conjoined with scarcity of fruit, in this isolated continent, develops flower-feeding birds wanting in other lands, such as the meliphagidæ or honey-suckers, and the tricho-glossidæ or brush-tongued lories. Peculiar to A. are, too, the megapodiidæ or brush-turkeys, the menuridæ or lyre-birds, and the atrichidæ or scrub-birds. The megapodiidæ do not sit on their eggs, but bury them under mounds of earth or vegetable matter, to be hatched by the sun or fermentation. The emu and cassowary of A. correspond with the ostrich of Asia and Africa. The podargi, of enormous mouth—'more-porks,' as they are called, from their singular cry—are a strange and unsightly Australian type. Among song-birds are the piping-crow or musical magpie, and the lyre-bird, with its mocking notes. Noteworthy for their curious habits are the satin-birds or bower-birds, which build their domiciles of twigs and branches, decorated with colored feathers, bones, and shells, some-

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times several feet long, arched over at the top, and which are made the rendezvous of many birds of both sexes. Altogether, A. has 650 distinct species of birds to muster against Europe's 500. Of reptiles, A. has no less than 140 different kinds, its largest lizard measuring from 4 to 6 ft. A. does not lack snakes. Though no vipers or pit-vipers are found, their place is filled by the elapidæ (a family including the Indian cobras), constituting two thirds of the snakes of A., all poisonous, though only five kinds are fatally so. The black snake of A. measures from 5 to 8 ft. long. A. abounds, moreover, in insects, beautiful and peculiar, though the butterfly is rare in the temperate zone, becoming numerous towards the tropics.

Aborigines.—Almost as much as its botany and zoology, the human natives of A. are isolated and peculiar, separated by a wide remove from the Papuans, the Malays, and the Negroes. Of a dark coffee-brown complexion, rather than actually black, the Australian stands not much short of the average European in height, but is altogether of much slimmer and feebler build; his limbs, in particular, very lean and destitute of calves (a defect common to dark races). His head is long and narrow, with a low brow prominent just above the eyes, but receding thence in a very marked degree. The nose, proceeding from a narrow base, broadens outwardly to a somewhat squat end, the eyes on either side of its thin root appearing drawn together. The face bulges into high cheek-bones. The mouth is big and uncouth, the jaw-bone contracted, the upper jaw projecting over the lower, but with fine white teeth, the chin cut away. The whole head and face, and indeed the whole person, is covered with a profusion of hair, which, when freed of its usually enclogging oil and dirt, is soft and glossy. His ears are rather pricked forward. The effluvium of his skin, offensive in itself, is exaggerated by the fish-oil that he uses to anoint his person. The intellect of the Australian, directed almost exclusively on the means of procuring food, operates wholly within the range of the rudest bodily senses; but inside that elementary sphere, displays no little nimbleness and skill. He is unsurpassed in tracking and running down his prey; and his weapons, though most primitive, are well adapted to assist him in that purpose, as his rude culinary and domestic apparatus manifest equal skill. Indeed, he has some exuberance of rude sense, some imitative facility or elementary art, as may be observed in the crude figures of sharks, lizards, etc., carved on caves in the n.e., and on the rocks of New South Wales; as also in his language, which, within its very circumscribed sensuous sphere, is fairly expressive and complete; likewise in the facility with which he learns to chatter foreign languages. Outside this circle, however, all is blank to the Australian. He has no architecture, almost no weaving, no pottery, and may be said to have no religion. His sensations have hardly, if at all, reached the length of sentiments, far less sentimentalities. The man lords it over the woman, who is as much his property as is his 'boomerang' or 'dingo.' The male offspring is, indeed, in considerable estimation;

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and a father will lament the death of his son for months, or even years. Old men and old or infirm women are mercilessly abandoned. In summer, the aborigines roam about naked, and sense of shame seems almost wholly undeveloped in them. Their decalogue is all reduced to the notion of property, wives being one item in a man's chattels, the stealing of which has a definite punishment meted out to it. Where caves abound, some of the tribes seek no further, but live in those ready-made tenements. Fixed habitations none of them have; at best, only a screen of twigs and bushes, covered with foliage or turf; sometimes logs of wood and turf serve for a few days' or weeks' shelter, till the pursuit of food calls them elsewhere. Thrift is unknown. Life of the Australian alternates between satiety and semi-starvation. In summer, he goes naked; in winter, he wraps himself in kangaroo skins. To hold his dowak or digging-stick, he binds a girdle of hair about his loins. For protection against scrubs, he hangs an apron of skins to the girdle. By way of food, he devours many animals alive, including lizards, snakes (of which the head is rejected), frogs, larvæ, white ants, moths. Other animals are roasted. Cannibalism is general, and in seasons of dearth, when he cannot get hold of an enemy, the Australian has his wife and children to fall upon. The wife is bound to keep her lord in vegetable food; roots of wild yam, seeds of acacia, etc. If she fail to produce enough, she is liberally treated to maulings and spearings, so that a wife usually appears bruised and gashed all over. The 'boomerang' is a flat stick 3 ft. long, curved at centre, which when properly thrown into the air among birds, jerks in zigzag, spiral, or circular fashion, usually bringing down a few. In addition they have the throwing-stick, flint-pointed spears, nets of sinews, fibres, or hair, water-skins, canoes. There is no government among this people outside that of the family, and no laws except traditionary rules about property. In the way of religion, they have little save their terror of ghosts and demons, and some superstitious traditional rights applicable to certain epochs in a man's life, more particularly at his burial. At 10 years of age a boy is covered with blood; at 12 to 14, he is circumcised (in the s. or n., not in the w. or on the Murray). At 20, he is tattooed or scarred. Felicity after death is the reward of proper burial. A man dying in battle, or rotting in the field, becomes an evil spirit. For their curious exogamous marriage customs, see **TRIBE**. Their language is sensuous, their abstraction tending only in the way of arithmetic as far as the number 5, and that itself an unusual stretch; the language is of polysyllabic formation; the accent falling on the penultimate is not inharmonious. Though it comprehends many divergent forms, all seem fundamentally connected, forming a group wholly isolated from any of the linguistic families of the rest of the world. Their language is well developed and sensuously copious and

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expressive. Like almost all other savages, the native Australians are rapidly vanishing before the advance of civilization. The European settlers oust them out of all the more fertile and habitable lands, pressing them ever more into the desert of the interior; while the diseases and vices that they acquire from the new possessors are another potent factor of their destruction. The lowest estimate of their number, before European settlement among them, gives more than 150,000; the natives surviving being calculated now at about 75,000.

Population.—Area and population of the Australian Commonwealth by the census of 1901:

STATES.	Area in sq. m.	Pop.
New South Wales.....	310,700	1,354,846
Victoria	87,884	1,201,070
Queensland	668,497	496,596
South Australia	903,690	362,604
Western Australia.....	975,920	184,124
Tasmania	26,215	172,475
Total.....	2,972,573	3,771,715

CAPITALS OF STATES WITH POPULATION, 1901

Sydney	New South Wales.....	496,203
Melbourne.....	Victoria.	496,079
Brisbane.....	Queensland	119,428
Adelaide	South Australia..	163,430
Perth.....	West Australia	36,274
Hobart	Tasmania	24,655

The former colony of New Zealand, which had not (1903) entered the new Commonwealth, had a pop. (1901) of 772,719, of which 390,571 were on the North Island and 381,661 on the Middle Island. There were over 43,000 Maoris. In 1901 there were five towns with over 10,000 inhabitants in New Zealand: Auckland with suburbs, 67,226; Wellington (the seat of government) with suburbs, 49,344; Christchurch, with suburbs, 57,041; Dunedin, with suburbs, 52,390; and Sydenham, 11,404.

Produce.—The chief and most general staple produce of A., for which the island is peculiarly adapted, and which constitutes its largest export, is wool. Over all the highland and river-lands of the sea-border, wherever, in fact, there is water, sheep thrive remarkably, and the wool is of the finest quality, realizing the highest prices in the English market. In 1892 Victoria had 12,919,428 sheep; New South Wales 61,831,416; South Australia 7,646,239; Queensland 20,289,633; Western Australia 1,962,212; New Zealand 18,117,186; and Tasmania 1,662,801; total 124,428,915. The cereals of Europe, and maize, have been introduced into the island-continent with the happiest success. South A. is the principal wheat-growing colony. Potatoes everywhere yield abundantly. The vine is extensively cultivated. Sugar is a very important and increasing product of Queensland, and is considerably cultivated also in New South Wales. Cotton is grown in Queensland. The fruit-trees of Europe and of many of the

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tropical and sub-tropical climates thrive luxuriantly. The native timber is distinguished for hardness, durability, and adaptedness for building. Tobacco is grown for sheep-washing. Agricultural cultivation (1890) showed 7,066,379 acres under crop, beside 7,787,661 acres in artificially-grown grasses. S. Australia had the largest area of cultivation, then Victoria and New Zealand. Of the total area, 1,092,074,050 acres had not been either alienated or leased, and 810,727,062 acres were under lease.

Mining.—Mining is a great and growing industry, though gold-mining has for several years been steadily declining. Gold is distributed more or less through all the colonies, but the chief mines hitherto opened are in Victoria, where are seven mining districts: Ballarat, Sandhurst, Maryborough, Beechworth, Castlemaine, Ararat, and Gipps Land; the first three the most productive. The principal gold district of Queensland is in the Peake Downs. These gold fields employ a large number of Chinese. The total yield of gold in A., 1851–88, was £328,720,115 (£102,000,000 in 1851–59; £118,000,000 in 1860–69; £72,000,000 in 1870–79). In 1880, the yield of gold was only £4,000,000. Other kinds of mining, however, are greatly on the increase. The mineral production of A. 1890 amounted in value to \$59,697,280, and the total product up to that year to \$2,080,688,515, more than half of which came from the gold of Victoria.

Railways, Post-office, and Telegraphs.—Since 1870, railways and telegraphs have been increasing at a ratio, in relation to population, far exceeding that of almost any other country on the globe. In 1892 there were 12,139 m. of railways in operation, of which 11,402 m. belonged to the various colonies, and 737 m. to private proprietors. The mileage of the colonies was: Victoria 2,798; New South Wales 2,185; South Australia 1,679; Queensland 2,304; Western Australia 656; New Zealand 2,011; and Tasmania 506. The roads operated 1,645 locomotives; 3,140 passenger cars; and 35,574 freight and other traffic cars. The postal service had 5,965 offices, and handled in the year 182,418,373 letters, 25,619,596 books and packages, and 102,465,329 newspapers. The expenditures exceeded the receipts by about \$2,500,000. The telegraph service had 43,142 m. of line in operation and 1,027 m. under construction, handled 12,603,900 messages, cost for construction \$16,793,738, and received during the year \$3,323,068.

Commerce.—The trade of A. is exceedingly flourishing, the average of trade per inhabitant being about five times that of Europe, and nearly five times that of Canada. The imports of A. (including Tasmania and New Zealand) increased from \$140,361,660 in 1870 to \$349,756,976 in 1891; exports in same period from \$138,126,060 to \$352,713,916. Exports are principally wool, frozen meat, preserved meat, tallow, skins of all kinds, hides, wheat, cotton, sugar, and wine. The total tonnage of vessels 1891, exclusive of coasting trade (13,571,572 Brit. and 15,422,971 foreign), that entered and cleared was 17,317,492.

Government.—Prior to 1902 each colony formed a separate province, exercising its own administration, passing its laws, and levying its fiscal duties; and all of them exercising

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responsible government, except Western A., in which the executive council, as well as the governor, were exclusively the nominees of the home govt. The govt. in each colony consisted of the governor, representing and appointed by the queen; the legislative council, corresponding with the house of lords; and the legislative assembly, corresponding with the house of commons. The legislative council of New South Wales and Queensland was nominated by the crown; that of Victoria and South A. was elected by the inhabitants possessing a certain property qualification. The legislative assembly was in all four colonies, elected by manhood suffrage. In Western A. partly representative govt. was introduced 1870, through the appointment of a legislative council of 2 members, 7 of whom were nominated by the govt., and 14 by £10 householders. Imperial laws in all the colonies were in force, unless superseded by local enactments, and all acts passed by the local legislature had to receive the assent of the home govt. All votes were by ballot.

Religion and Education.—With the exception of New South Wales, where religious denominations all receive support from the govt. according to the strength of their membership, and in W. A., which constitutes a diocese of the Church of England, all religious sects in A. are self-supporting. In respect of numbers, Episcopacy is the dominant form of religion. Education has of late been rapidly diffused. In all the former colonies, education is either without cost and compulsory, or the primary schools are so liberally endowed by the govt., as to place elementary instruction within the reach of all classes; while libraries, museums, botanical gardens, schools of art, mechanics' institutes, etc., are multiplying in all the colonies under the liberal patronage of the several governments.

Finances.—Total revenue of the colonies (1890) \$141,991,227; (1891) \$146,544,935. The largest amount came from railways and tramways; then, in their order, customs, public lands, other taxation and excise, miscellaneous sources, and posts and telegraphs. In 1881-90 the increase in public revenue was nearly 50 per cent. The public expenditure (1890) was \$149,346,940; (1891) \$152,233,580. Nearly one fourth of this was for interest and charges on the public debt; the remainder was for railways and tramways, posts and telegraphs, public instruction, and other services of various kinds. The loan expenditures (1890) were \$869,320,976 for, in their order, railways and tramways; water supply and sewage; harbors, rivers, light-houses, docks, etc.; other public works; roads and bridges; immigration; and defense works. New South Wales, Queensland, and New Zealand were the only colonies that expended loan money on immigration. The public debt 1891, Dec. 31, was \$945,312,359, more than double the total 1881. Victoria, Queensland, S. Australia, and W. Australia about doubled their debts; New South Wales and Tasmania tripled theirs; and New Zealand's increased about 40 per cent. The liabilities of the banks of issue for the last quarter of 1890 were \$569,843,522, and their assets \$828,003,682; and the savings banks had 674,370 depositors, and to their credit. During the first half of 1893

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Australia suffered from the most severe financial panic in its history. From 1880 to '91 the foreign trade of the colonies increased from \$153,750,000 to \$220,000,000 or 43 per cent., while the bank discounts increased from \$290,000,000 to \$705,000,000 or about 143 per cent., and the loans to Australian banks from England from nothing to \$215,000,000. Suspicion of the soundness of the banks had led to steady withdrawals of deposits during the two previous years culminating in such heavy runs in 1893 as to cause (before June 1) the suspension of 14 of the great banks of the colonies with over \$411,000,000 deposits.

Australian Commonwealth.—The agitation looking toward a federation of the Australian colonies was begun in 1852. The first convention for this purpose was held at Hobart 1886, Jan., but this effort was abortive. Another convention consisting of representatives from all of the colonies (now states) was held in Melbourne in the early part of 1891, and adjourned April 9, after submitting a draft of a federal constitution for approval by the people. After five colonies, viz., New South Wales, Victoria, Queensland, South Australia, and Tasmania, had by legislative enactments 1889, Feb. 2, declared their desire for a federal union, an act was passed by the British parliament 1900, July 9, to establish the Commonwealth. As this act provided for the inclusion of Western Australia that colony joined the federation in the following month.

The constitution of the new Commonwealth thus agreed upon more nearly resembles that of the United States than any other, but it has also some not unimportant differences. The Commonwealth government is in the hands of a governor-general, who is appointed from time to time by the British cabinet to represent the sovereign, but who—like the sovereign himself in England—takes no active part in the work of administration, but is guided solely by the advice of a cabinet, or ministry, consisting of members of the federal parliament who are able to command a majority of votes in the chambers, particularly the chamber of representatives, which possesses the control of the finances of the Commonwealth.

The legislative power rests with the parliament, consisting of two chambers—a senate of thirty-six members, six from each state without reference to population; and a representative chamber consisting of seventy-two members, elected every three years by the people of the states, in proportion to their population as ascertained at each census. The senators are elected by the people of their respective states, not as here by the state legislatures, and hold office for six years, two of them retiring every second year. The control of taxation and finance resides in the representative chamber, the senate being empowered to pass or reject, but not to amend any act dealing with either the raising or appropriating of public money, as is the case with the two houses of the British parliament. The most novel provision of the legislative arrangement is a provision that in case a deadlock on any measure shall arise between the two chambers, which

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shall continue after a new election of the representative chamber, it shall be brought to an end by a joint sitting of the members of the two chambers, a simple majority of the votes of the whole number present deciding.

The powers of the federal executive and parliament are strictly confined to the subjects specified in the constitution, all others remain under the control of the states.

The federal government alone has the right to impose customs or excise taxation, and the postal and telegraph systems also fall into its hands. As the public debts of the various states, however, remain as at present state liabilities, provision is made for the return to the various states of all the revenue thus raised which is not required for federal purposes, in proportion as it is contributed by each. The railroads of the country, which are all state property, remain as at present under state control, subject to the provision that they may be used by the federal authorities at any time when needed for the conveyance of troops or for other defence purposes.

The first governor-general, the Earl of Hopetoun, was inaugurated at Sydney, 1901, Jan. 1. The Duke and Duchess of Cornwall and York visited Australia 1902, and the Duke carried out his mission of opening the first session of parliament of the Commonwealth at Melbourne May 9, in the presence of a vast assembly.

AUSTRASIA, *aws-trā'shī-a*: or the **EAST KINGDOM**: name given, under the Merovingians, to the eastern possessions of the Franks, comprising Lorraine, Belgium, and the right bank of the Rhine, and having their central point at Metz. At the rise of the Frankish power, these districts were of great importance, as they formed the connection with the German mother-country, and were the most thickly inhabited by Franks. After the time of Charles Martel, the division of the Frankish kingdom into A. and Neustria lost its political importance. Under Charlemagne's successors, A. merged into Germany—and Neustria, or West Frank-land, into France.

AUSTREBERTA, *ōs-t'r-bér'ta*, **SAINT**: 633-704; b. Artois, France; daughter of Badefroy, kinswoman of Dagobert. She became prioress of the abbey of the Port, then abbess of Pavilly, and gave, through her whole life, an example of piety.

AUSTREGILDE, *ōs-t'r-zhēld'*: died 560: second wife of Gontran, King of Burgundy; at first simple attendant to Queen Marcatrude; but managed to cause her repudiation and to step into her place, 556. She even induced Gontran himself to put to death the two brothers of the ex-queen, but did not long enjoy the fruits of her perfidy.

AUSTREGISILLA, *ōs-t'r-zhī-zī'lla*, **SAINT**, commonly Saint Austrille, or Saint Outrille: 551-624; b. Bourges, France. After having filled different offices at the court of Gontran, he was ordained a priest; was 20 years abbot of Saint Niziers, at Lyon, then Bp. of Bourges, 611. His relics, exhumed 1334, were burned in the 16th c. by the Protestants.

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AUSTRIA, *aws'trĭ-a*, ARCHDUCHY OF: the cradle and nucleus of the Austrian empire, lies on both sides of the Danube, from the mouth of the Inn to Presburg, on the borders of Hungary; about 15,000 sq. m. It now forms three of the crown-lands, or administrative provinces of the empire—viz., Lower and Upper Austria (or Austria below, and Austria above the Ens), and the Duchy of Salzburg. See AUSTRIA, EMPIRE OF. The s. and w. portions are mountainous; the n. and e. are more level and fertile, containing the great plain of Vienna, the Marshfeld, etc. The chief towns, besides Vienna, are Wiener-Neustadt, Salzburg, Steyer, Linz, and Ischl (q.v.). Pop. (1890) 3,621,140, mostly German and Rom. Cath.

AUSTRIA, EMPIRE OF, or AUSTRO-HUNGARIAN MONARCHY: a compact territory with a circumference of about 5,350 m. The body of the empire is in the interior of Europe, though it has about 500 m. of sea-coast on the Adriatic. A. borders on Italy, Switzerland, Bavaria, Saxony, Prussia, Russia, Roumania, Servia, Turkey, and Montenegro. With the sanction of the Berlin Congress of 1878, the small territory of Spizza, on the Montenegrin frontier and formerly Turkish, has been incorporated with Dalmatia; the Turkish provinces of Bosnia and Herzegovina, though occupied and administered by Austria, cannot be regarded as part of the Austro-Hungarian monarchy. The following table shows the area and population of the empire at the census of 1900, Dec. 31:

PROVINCES.	Area: Eng. sq. m.	Population.	Pop. per sq. m.
Lower Austria.....	7,654	3,100,493	405
Upper Austria.....	4,631	810,246	175
Salzburg.....	2,767	192,763	69
Styria.....	8,670	1,356,494	156
Carinthia.....	4,005	367,324	91
Carniola.....	3,856	508,150	132
Coast land.....	3,084	756,546	245
Tyrol and Vorariberg....	11,324	981,949	86
Bohemia ..	20,060	6,318,697	315
Moravia.....	8,583	2,437,706	284
Silesia	1,987	680,422	342
Galicia.....	30,307	7,315,939	241
Bukowina.....	4,035	730,195	181
Dalmatia.....	4,940	598,784	120
Total, Austria.....	115,903	26,150,708	226
Civil population:			
Hungary Proper....	109,007	16,721,574	153
Croatia and Slavonia ..	16,423	2,400,766	146
Hungary.....	125,430	19,122,340	152
Population in active military service :			
Hungary Proper		116,681	...
Croatia and Slavonia.....		15,588	...
Hungary.....		132,219	...
Total population:			
Hungary Proper.....	109,007	16,838,255	154
Croatia and Slavonia.....	16,423	2,416,304	142
Total, Hungary.....	125,430	19,254,559	154
Total, monarchy.....	241,333	45,405,267	...

The above total includes the army and landwehr.

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Surface.—Three-fourths of A. is mountainous or hilly, being traversed by three great mountain chains—the Alps, Carpathians, and Sudetes (q.v.), whose chief ridges are of primitive rock. The Rhatian and Noric Alps stretch from Switzerland to the Danube, and contain the highest points of the Austrian territories, the Ortler Spitze rising to 12,779 English ft. Their height declines gradually towards the e., where the Leitha Hills (3,000 ft.), overlooking the plain of Vienna, form the transition to the Carpathians. This chain rises on the left bank of the Danube, near Presburg, and sweeping in a curve, first e., and then s. through Transylvania, again meets the Danube. The highest point is Butschetje in Transylvania, where a height of 9,528 ft. is reached. The central part, or Tatra Mountains, are vast granitic masses, resembling the Alps in character; the highest of these is the Lomnitz, in the longitude of Cracow, 8,133 ft. The Alps are accompanied, n. and s., by parallel ranges of calcareous mountains, covering whole provinces with their ramifications. The Carpathians are lapped on their n. side by sandstone formations; mountains of the same character also occupy Transylvania. Springing from the n.w. bend of the Carpathians, the Sudetes run through the n.e. of Moravia and Bohemia, in which last the range is known as the Riesengebirge, or Giant Mountains. The boundary between Bohemia and Prussian Silesia passes over the Schneekoppe, the highest peak of these mountains, 5,275 ft. in height. Continuous with this range, and beginning on the left bank of the Elbe, are the Erzgebirge, or Ore Mountains, on the confines of Saxony; and veering round to nearly s.e., the range is further prolonged in the Bohemian-Forest Mountains, between Bohemia and Bavaria.—The chief plains of the Austrian empire are the great plains of Hungary (the smaller of these is in the w., between the offsets of the Alps and Carpathians, about 4,200 sq. m.; the other in the e., and traversed by the Danube and the Theiss, 21,000 sq. m.), and the plain of Galicia.

From the Gulf of Trieste to the s. point of Dalmatia, A. has a sea-line of about 1,000 m., not counting the coasts of the numerous islands, the largest of which is Veglia, 23 m. by 12. The chief lakes are the Platten See (about 400 sq. m.), and the Neusiedler See (about 100 m.), both in Hungary. The first is navigable by steamers, and both are rich in fish, and have fruitful vineyards around them. The Alps and Carpathians enclose numerous mountain lakes. The Long Lake in the Tatra Mountains lies at an elevation of 6,000 ft. The most remarkable of all is the Zirknitz Lake (q.v.) in Illyria. There are extensive swamps or morasses in Hungary. One connected with the Neusiedler See covers some 80 sq. m. Much has been done in draining morasses.

The leading rivers that have navigable tributaries are: the Danube (q.v.) which has a course of 849 m. within the Austrian dominions, from Passau, at the mouth of the Inn, to Orsova, on the frontier of Walachia; and receives,

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on the right, the Inn, Traun, Ens, Leitha, Raab, Drau, and Save; and on the left, the March, Waag, Neutra, Gran, Theiss, Bega, and Temes: the Vistula (q.v.), with its tributary the Bug: the Elbe (q.v.), with the Moldau and Eger: the Dniester and Adige (q.v.) have no navigable tributaries; this last, which rises in the Rhætian Alps, and flows past the famous city of Trent, enters Lombardy above Verona, and confers on that country the benefits of what commercial importance it possesses—being navigable only up to a point below Legnago. The Rhine bounds the empire for only about fourteen m. above Lake Constance. The Isonzo, Zermagna, Kerka, and Narenta flow into the Adriatic.

The canal system of Austria is not extensive. The Vienna and Neustadt canal, in Lower Austria, has a length of 40 m.; the Bacser or Franz canal, between the Danube and Theiss in Hungary, 69 m.; and the Bega canal, constructed by the Romans, between the Bega and Temes, 83 m. Extensive lines are still capable of being opened, affording communication with many places now inaccessible, and rescuing tracts of arable land from inundations.

The *climate* of A. is on the whole very favorable; but from the extent and diversity of surface, it presents great varieties. In the warmest southern region between 42°–46° lat., rice, olives, oranges, and lemons ripen in the better localities; and wine and maize are produced everywhere. In the middle, temperate region from 46°–49°, which has the greatest extent and diversity of surface, wine and maize still thrive in perfection. In the n. region, beyond 49°, except in favored spots, neither wine nor maize thrives; but grain, fruit, flax, and hemp thrive excellently. The mean temperature of the year is, at Trieste, 58° F.; at Vienna, 51°; at Lemberg, in Galicia, 44°.

The raw products of A. are abundant and various; and in this respect it is one of the most favored countries in Europe. What one province lacks, another supplies. Its mineral wealth is not surpassed in any European country; it is only lately that Russia has exceeded it in the production of gold and silver. Mining has been a favorite pursuit in A. for centuries, and has been encouraged and promoted by the government. Bohemia, Hungary, Styria, Carinthia, Salzburg, and Tyrol take the first place in respect of mineral produce. Except platina, none of the useful metals is wanting. The mines are partly state property and partly owned by private individuals. The value of their yearly produce is estimated at about \$45,000,000. Of this sum, coal yields about a half, iron a fifth, salt a tenth, and gold and silver together one-fourteenth. The number of persons employed in mines and smelting-works is about 150,000, a third in Hungary. Gold is found chiefly in Hungary and Transylvania, and in smaller quantity in Salzburg and Tyrol. The same countries, with Bohemia, yield silver. The discovery of quicksilver at Idria (q.v.) first brought this branch of

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mining industry into importance. This metal is now also found in Hungary, Transylvania, Styria, and Carinthia. Copper is found in many districts—tin, in Bohemia alone. Zinc is got chiefly in Cracow and Carinthia. The most productive lead-mines are in Carinthia. Iron is found in almost every province of the monarchy, though Styria, Carinthia, and Carniola are chief seats. The production, though great, is not yet equal to the consumption. Antimony is found only in Hungary; arsenic is found in Salzburg and Bohemia; cobalt in Hungary, Styria, and Bohemia; sulphur in Galicia, Bohemia, Hungary, Salzburg, etc. The mineral output of A. 1891 was:

PRODUCT.	Metric Tons.	Value in Florins.
Gold ore.....	4,397	14,446
Silver ore.....	145,383	3,180,885
Quicksilver ore.....	706,332	1,035,561
Copper ore.....	93,180	354,575
Iron ore.....	12,312,484	2,854,889
Lead ore.....	133,607	1,068,512
Zinc ore.....	228,282	575,547
Tin ore.....	7,205	3,600
Bismuth ore.....	10,833	25,476
Antimony ore.....	3,334	42,575
Arsenic ore.....	42	391
Uranium ore.....	255	19,314
Wolfram ore.....	567	21,380
Sulphur ore.....	30,885	37,204
Alum and alum stone.....	343,913	20,450
Manganese ore....	52,793	70,743
Graphite.....	213,462	693,327
Asphalt.....	1,800	2,808
Lignite.....	161,830,762	30,769,056
Bituminous coal.....	91,928,846	32,684,693

The total value was 73,465,432 florins, or about \$24,978,246.

A. is peculiarly rich in salt. Rock-salt is in immense beds on both sides of the Carpathians, chiefly at Wieliczka (q.v.) and Bochnia in Galicia, and in the county of Marmaros in Hungary, and in Transylvania. The annual produce of rock-salt is greatly above 3 million cwt. Salt is also made at state salt-works by evaporating the water of salt-springs. The chief works are those at Ebensee, Aussee, Hallstadt, Ischl, Hallein, and Hall in Tyrol. From two to three million cwt. are thus produced annually. A considerable quantity is made also from sea-water on the coasts of the Adriatic. The sale of salt is in A. a government monopoly. Of other salts, alum, sulphate of iron, and sulphate of copper are the chief. There are inexhaustible deposits of coal in the monarchy; but they have not yet been rightly explored, nor are nearly all that are known yet worked. They are spread over all the provinces; but the richest are in the mountain-systems of Moravia and Bohemia. Of recent years, however, much has been done to develop this branch of mining. A. has abundance of mineral springs, frequented for their medicinal qualities; 1,600 are enumerated, some of them of European reputation, as the sulphurous baths of Baden in Lower A., the saline waters of Karlsbad, Marienbad, and Ofen, etc.

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The *vegetable productions*, as might be expected from the vast variety in the soil and position of the different provinces, are extremely various. Although three-fourths of the surface is mountainous, more than five-sixths is productive, being used either for tillage, meadows, pasture, or forest. Grain of all kinds is cultivated, most abundantly in Hungary and the districts s. of it on the Danube; in Bohemia, Moravia, Silesia, and Galicia. Agriculture is not far advanced; the prevailing system is still what is called the three-field system, introduced into Germany by Charlemagne, in which a crop of winter wheat is followed by one of summer grain, and that by fallow. In Hungary, the Magyar adheres to his primitive husbandry, the German and Slav are adopting rational methods. Rice is cultivated in the Banat, but not enough for the consumption. Potatoes are raised everywhere; and in elevated districts are often the sole subsistence of the inhabitants. Horticulture is carried to great perfection; and the orchards of Bohemia, A. proper, Tyrol, and many parts of Hungary, produce a profusion of fruit. Great quantities of cider are made in Upper A. and Carinthia, and of plum-brandy in Slavonia. In Dalmatia, oranges and lemons are produced, but not sufficient for the requirements of the country; twice as much olive-oil is imported as is raised in the monarchy.

In the production of wine, A. is second only to France. With the exception of Galicia, Silesia, and Upper Austria, the vine is cultivated in all the provinces; but Hungary stands first, yielding not only the finest quality of wine, but four-fifths of the whole produce of the empire. The average produce of the whole empire is estimated at about 200 million gallons, consumed mostly by the inhabitants themselves.

Of plants used in manufactures and commerce, the first place is held by flax and hemp. Flax is cultivated almost universally; white hemp in Galicia, Moravia, and Hungary. Tobacco is raised in great quantities, especially in Hungary, which is first also in the cultivation of rape-seed. Bohemia raises hops of the first quality, which are partly exported; though other provinces require to import from abroad. The indigo plant has been lately successfully acclimatized in Dalmatia. Nearly a third of the productive surface is covered with wood (66,000 sq. m.), which, besides timber, yields secondary products, as tar, potash, charcoal, bark, cork, etc.

As to *animals*, bears are found in the Carpathians, Alps, and Dalmatia; wolves, jackals, and lynxes in the same districts, and also in the Banat, Croatia, Slavonia, and the Military Frontiers.—The marmot, otter, and beaver also are found in Dalmatia. Game has of late sensibly diminished. The wild goat lives in the highest, the chamois and white Alpine hare in the middle regions of the Alps and Carpathians. More productive than the chase are the fisheries of the Danube, Theiss, and numerous streams, lakes, and ponds. The chief sea-fishing is in Dalmatia. Leeches, procured chiefly in Hungary and Moravia, are an article of trade. For foreign commerce the most important branch of rural industry is the rearing of silk. A. produces about

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a quarter of a million of silk cocoons annually. The silk trade is very extensive in the Tyrol—the yearly supply of cocoons in that country being 32,000.

The breeding of *domestic animals* has not yet equalled what home wants require. In some districts it is excellent, in others neglected. Horse-breeding is promoted by what are called ‘military studs.’ Besides a number of imperial studs, there are many private establishments, especially in Hungary, for the same purpose. The supply of black-cattle is not equal to the demand; great numbers are furnished by Hungary and Galicia. The breeding of sheep, like that of horses, has been a special object of care to the government. The finer wools are furnished by Moravia, Bohemia, Silesia, Lower Austria, and great part of Hungary and Galicia. The great mass is, however, composed of what is known as middling and inferior sorts. Goats are reared chiefly in Dalmatia, and swine in Hungary.

Population.—Principal cities, 1900, Dec. 31:

Vienna	1,674,957	Szabadka.....	82,122
Buda-Pesth	732,322	Delreczen	75,006
Prague	201,589	Pilsen.....	68,079
Lemberg.....	159,877	Czernowitz... ..	67,622
Gratz	138,080	Pozsony	65,867
Trieste	134,143	Zágráb	61,002
Brunn.....	109,346	Hódmező-Vasarhely....	60,883
Szeged	102,991	Liniz	58,791
Kraku	91,323	Kecskemét	57,812

The following shows the distribution of pop. 1900 :

Austria by language :

German	9,170,939
Bohemian, Moravian and Slovak....	5,955,397
Polish.....	4,259,152
Ruthenian.....	3,375,576
Slovene	1,192,780
Servian and Croatian	711,380
Italian and Latin.....	727,102
Roumanian	230,963
Magyar	9,516

Hungary by language :

Hungarian (Magyar).....	8,679,014
German	2,114,423
Slovak	2,008,744
Roumanian.....	2,785,265
Ruthenian.....	427,825
Croatian	1,667,377
Servian.....	1,045,550
Others.....	394,142

Combining both countries, the distribution was about as follows: Germans 11,285,000; Hungarians 8,700,000, Bohemians, Moravians, and Slovaks 7,964,000; Poles 4,259,000; Ruthenians 3,804,000; Servians and Croatians 3,424,000; Roumanians 3,025,000; Slavonians 1,200,000; Italians 725,000; and all others 395,000. In Cisleithania or A. proper the inhabitants averaged 80 to each sq. kilometre, and in Transleithania or Hungary 54. Despite the efforts of the govt. to obstruct or prevent emigration, the exodus shows steady increase.

Religion.—Religious bodies in A. are regulated by the statutes of 1867 and 8, and though the Rom. Cath. Church pre-

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dominates, full liberty of faith and conscience is secured to all religious bodies legally recognized. The right to grant legal recognition is vested in the minister for ecclesiastical affairs, who must be convinced that the applicant body has nothing in doctrine, worship, constitution, or designation that is illegal or immoral. Religious liberty, as far as concerns public worship and preaching, does not extend beyond the limits of those bodies which have been granted official recognition. All other bodies are restricted in their rights of assembly to such meetings as can commune privately in households. Serious hindrances are thus put in the way of missionary enterprise. The bodies recognized 1893 were: the Rom. Cath.; Old Cath.; Greek-Oriental; Evangelical (Augsburg or Lutheran and Helvetian or Reformed); Evangelical Brotherhood; Gregorian-Armenian; and Jewish. In Hungary the legally recognized religions were: Rom. Cath.; Evangelical (Augsburg and Helvetian); Greek-Oriental; Gregorian-Armenian; Unit.; and Jewish, and all these have perfect equality. The following shows the pop. of A. only by religious belief.

Rom. Cath.....	18,934,166
Greek Cath., United.....	2,814,072
Armenian, United.....	2,611
Old Cath.....	8,240
Greek-Oriental.....	544,739
Gregorian-Armenian.....	1,275
Prot. A. C.....	315,823
Prot. H. C.....	120,524
Moravian.....	368
Anglican.....	1,296
Anabaptists.....	490
Unitarians.....	147
Lippowans.....	3,218
Israelites.....	1,143,305
Mohammedans.....	81
Other Confessions.....	745
Disbelievers.....	4,308

During 1880-90 only the United Armenians, Gregorian-Armenians, Anabaptists, and Unitarians showed a decrease; while all other confessions, except the Rom. Cath., showed increase above the percentage of the total average.

Education.—The educational system comprises elementary schools, gymnasia and realschulen, universities and colleges, technical high schools, and schools for special subjects. In 1891, A. had 18,666 elementary schools; 63,159 teachers; 3,156,618 pupils in attendance out of 3,665,598 children of school age; 70 training colleges; 173 gymnasia with 3,527 teachers and 52,959 pupils; 77 realschulen with 1,412 teachers and 19,124 pupils; 8 universities with 1,222 professors and 13,599 students; 45 theol. colleges with 2,244 students; 70 commercial schools; 619 industrial; 97 agricultural; 89 forestry; 6 mining; 4 nautical; and 6 veterinary. In 1889-91, Hungary had 16,737 elementary schools; 24,622 teachers; 2,013,539 pupils in attendance out of 2,470,923 children of school age; 71 training colleges; 149 gymnasia (excepting Croatia), with 2,477 teachers and 38,916 pupils; 32 realschulen with 665 teachers and 8,300 pupils; 3 universities with 296 professors and 4,498 students; 55 theol. colleges with 1,829 students; 11 law schools; 98 commercial; 265 industrial; 39 agricultural; and 9 art

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Hungary also had 729 institutions for the care of young children, 89 'humanistic' schools, and 30 prison schools, with total attendance 70,283. There were also about 1,500 special technical institutes in A., and 449 in Hungary, with total students about 150,000. A. had 1,801 periodicals, and Hungary 834.

Vital Statistics.—The following table shows the marriages, births, deaths and also illegitimate births which for Austria average about 14 per cent. of the whole while for Hungary the average is but 8 per cent:

		Marr'ges.	Total births.	Illeg'm'te births.	Deaths.
Austria	1888	185,991	915,702	135,761	686,573
	1889	177,771	924,690	137,583	620,447
	1890	178,906	894,356	128,702	696,324
	1891	786,418	947,017	139,512	673,315
Hungary	1887	151,511	758,231	61,819	568,533
	1888	158,881	759,662	61,911	544,473
	1889	140,524	767,884	61,468	512,852

The *manufacturing industry* of A. is not adequately developed, but of late years has made great strides. The annual value of its manufactures—not including small trades—is estimated at 1,200–1,500 million florins, while that of its husbandry may reach 2,500 millions. Bohemia takes the lead in this industry, then follow Austria proper, Moravia and Silesia, and Hungary. Vienna is the chief seat of manufacture for articles of luxury; Moravia, Silesia, and Bohemia, for linen, woolen, and glass wares; Styria and Carinthia, for iron and steel wares. The chief manufactured articles of export are those of silk and wool; the only others of consequence are linen twist, glass wares, and cotton goods. The yearly value of manufactured iron is about 54 million florins. The glass wares of Bohemia are of special excellence. The hemp and flax industry is one of the oldest and still most important. No branch of industry has risen more rapidly than that of cotton. The manufacture of silk is very extensive. The manufacture of tobacco is a state monopoly, and brings a revenue of nearly 60 million florins; the salt monopoly, 18 millions.

In respect of *commerce*, A. is most unfavorably situated. High mountains oppose great obstacles in all directions to communication, and separate the producing districts from the only sea that touches the empire; while the chief navigable rivers have their mouths in other countries. Much has been done to remedy these obstacles. Since 1809, a length of 20,000 m. of highways has been made. The great Alpine roads over the Stelvio Pass and the Semmering (q.v.) are among the most remarkable constructions of our times. More remarkable still are the railways over the Brenner Pass and the Semmering. The first railway in A. was a horse railway, constructed 1825–32. The state, 1841, resolved to undertake the construction of railways, and since then a great extent has been laid down. A measurably complete network of railway now brings all places of importance into easy communication with each other. The total length of railways in the empire open for traffic 1891. Jan., was 16,712 English m.

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At the close of 1890 there were 4,744 post-offices, which had 25,974 employés, and handled 592,760,000 pieces; 3,781 telegraph offices, which handled 9,000,000 messages; and 53 city and 14 suburban telephone lines with 23,618 m. of wire. The pneumatic post at Vienna dispatched 2,760,000 pieces of matter. The combined postal and telegraph service showed a surplus earning of \$1,292,000, a decrease of \$170,000 compared with the previous year.

River-communication received a great impulse from the introduction of steam. By means of the Danube Steam-company, formed 1850, and a second company (1852) confined to tug-navigation, passengers and goods are now conveyed on the Danube between Ulm and Galatz, and on to Constantinople. The Austrian Danube Steam-company has a fleet of steamers plying on the Danube, the annual receipts from conveyance of goods being more than 7 million florins. This traffic would be vastly greater were the lower Danube freed from the influence of Russia.

A great number of the political impediments to commerce have been removed or diminished. The customs-boundary that separated Hungary and the adjoining provinces from the rest of the empire was done away in 1851, so that the whole was included in one customs-district, with the exception of Dalmatia, the free ports of Triest, Fiume, &c. These have been incorporated with the rest of the empire. Fiume and Trieste ceased to be free ports 1891. By the tariff of 1852, A. passed from a prohibitive to a protective system. No article is admitted duty-free; but absolute prohibition is confined to articles of state monopoly (salt, powder, and tobacco). But the foreign commerce of A. is nothing compared with that between the different provinces.

From 1875 to 85, the total imports were smallest in 1876 (\$216,425,520), and highest in 1882 (\$264,942,900); the exports smallest in 1875 (\$223,098,300), and highest in 1882 (\$316,667,880). The commercial returns for 1891 showed imports of merchandise to the value of \$220,422,000, and exports \$272,374,000, the imports showing an increase of \$12,784,000 and the exports of \$10,093,000 over 1890. The balance of the value in favor of the exports against imports 1891 was \$51,952,000, decrease of \$2,686,000 over 1890; and the excess of exports over imports 1882-91 was \$476,544,000. The imports of precious metals and coins were \$13,430,000, exports \$3,944,000. During 1902 the total exports from the monarchy amounted to \$382,500,000, which was \$5,400,000 more than the value of the exports in 1901, and the total imports amounted to \$344,760,000, being \$14,240,000 more than in 1901. The balance in favor of the monarchy amounted to \$37,740,000, a decrease of \$8,840,000 from the balance of 1901, due to the striking rise in imports, the increase in 1902 of imported raw materials for manufacturing was especially notable; cotton gained \$4,820,000; wool and worsteds \$4,560,000.

The chief harbors of A. are those of Istria—Triest, Rovigno, Pirano, Citta Nuova, etc.; of Croatia—Fiume, Buccari, Novi; of Dalmatia—Zara, Spalatro, Ragusa, Cattaro, Curzola, etc.

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As to *form of government*, A. is a monarchy hereditary in the House of Hapsburg-Lothringen. In the case of the reigning family dying out, the states of Bohemia and of Hungary have the right of choosing a new king; but for the other crown-lands, the last sovereign appoints his own successor. The reigning house must profess the Rom. Cath. faith.

Till 1848, Hungary and Transylvania had a constitution limiting the monarchy, which was absolute for the rest of the empire; though the several provinces had each its consultative council of clergy, nobles, and burghers. After the Revolution of 1848, and the subsequent reaction, all marks of independence of the separate provinces disappeared. The imperial constitution granted (*octroyirte*) 1849, March 4, as well as the provincial constitutions that followed, were abolished, and government was organized in the most absolute form by the imperial 'patent' or charter of 1851, Dec. 31. The patent guaranteed to every religious body recognized by law protection in the observance of public ordinances, in the management of its own affairs, and in the possession of buildings and funds for the purpose of worship and instruction. The relation of the Rom. Cath. Church to the state was put upon a new footing. It was no longer under the oversight of the secular authority, the *placetum regium* and church-patronage were abolished, ecclesiastical jurisdiction for discipline, and the independent administration of church-property, were conceded, and the intercourse of bishops and of all Rom. Catholics with Rome left free. The clergy had no longer to submit to examination or tests on the part of the state; they were nominated by the state, but only with the concurrence of the bishops, and without that concurrence they could not be deprived of their office. With all this, they obtained an overwhelming influence over education, even in the universities; and by the concordat signed early in 1856, this influence was very greatly increased. The patent further guaranteed the equality in the eye of the law of all citizens, irrespective of nation, rank, or religion, and the liberation of the land from all serfdom. Subsequent patents (e.g. for Hungary, Croatia, etc., 1853) regulated the claims between existing proprietors and their vassals, and determined the indemnities due to the former for their seignorial rights.

But since 1867, Austria has been reconstructed as a two-fold empire, consisting of a German or 'Cisleithan' monarchy, and a Magyar or 'Transleithan' kingdom. The former is generally known as Austria proper, and the latter as Hungary. Each of the two countries has its own laws, parliament, ministers, and government; and the formal tie between them is a body known as the Delegations. These form a parliament of 120 members: one half is chosen by the legislature of German Austria, which is represented by it, while the other half represents Hungary. The person of the sovereign is another knot in the tie between the two members of the empire. The Magyars claim, under certain conditions, the right of freely electing their monarch. The Delegations have jurisdiction over all matters affecting the

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common interests of the two countries, especially foreign affairs, war, and finance; the ministries of which three departments are responsible for the discharge of their official functions to the Delegations, a committee of whom sits permanently. The acts of the delegations require to be confirmed by the representative assemblies of their respective countries; and in this manner it is attempted to provide for the self-government of both Austria proper and Hungary.

The administration of Austria proper is divided at present among seven ministries—Public Education and Ecclesiastical Affairs, Agriculture, Finance, Interior, National Defense, Commerce, and Justice. Formerly the ministry was merely the collective organ of the emperor, and was responsible to him alone. But a bill passed by the Reichsrath, 1867, and sanctioned by the emperor, renders it responsible to that parliament of the western empire.

The Reichsrath consists of an upper and a lower house. The upper house is constituted by princes, nobles, archbishops, bishops, and life members nominated by the emperor. The lower house numbers 425 members, elected by the 14 provincial diets of the empire in the following proportions: Bohemia, 110; Dalmatia, 11; Galicia, 78; Higher Austria, 20; Lower Austria, 46; Salzburg, 6; Styria, 27; Carinthia, 10; Carniola, 11; Bukowina, 11; Moravia, 43; Silesia, 12; Tyrol, 21; Vorarlberg, 4; Istria, 5; and Trieste, 5. The members of the Reichsrath are elected in the provincial diets, and no one who is not a member of one of these is eligible to the wider sphere of legislation. The emperor nominates the presidents and vice-presidents of both houses. The rights claimed by the Reichsrath are: 1. *Consent* to all military laws; 2. *Co-operation* in legislature affecting trade and commerce, customs, banking, posting, telegraphs, and railways. 3. Examination of the estimates, and general control of the public debt. To give validity to bills passed by the Reichsrath, the consent of both chambers is required, as well as the sanction of the emperor.

The executive of Hungary is administered in the name of 'the king' by a responsible ministry.

Finances.—The revenue of the empire 1892 was \$397,446,426, and for joint purpose \$58,080,888; expenditure \$396,636,264, for joint purpose \$58,128,516. The public debt 1890, Dec. 31, was: general debt \$938,978,000, special Austrian debt \$359,992,000; redemption of mortgages \$19,244,000—total \$1,318,214,000. Of the special Austrian debt \$153,748,000 were for railroad extensions, and \$2,890,000 for improvements on the Danube. The budget for Austria alone 1891 was: receipts \$175,610,000, expenditures \$191,930,000. The largest receipts were, in their order, from direct taxes, excise on eatables and liquors, tobacco monopoly, railroads, and customs. In 1892 the debt of Austria alone was \$1,572,637,680; of Hungary alone \$702,350,676; common debt of Austria and Hungary \$184,582,800. The budget for A. and Hungary in common for 1893 called for \$108,679,601.92 for the dept. of foreign affairs, war, and the amortization of the public debt. In 1902 the revenue and

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expenditure of the monarchy for purposes in common amounted to \$78,950,000. A. had revenue \$358,275,000 and expenditure \$358,100,000; Hungary had revenue \$226,437,500 and expenditure \$226,406,250; Croatia and Slavonia had revenue \$3,950,000 and expenditure \$39,250,000; and Bosnia-Herzegovina had revenue \$9,075,000 and expenditure \$9,050,000.

*History.**—The nucleus around which this great empire has grown was that part of the Archduchy of A. that lies below the Ens. In the age of Charlemagne, about 800, the defense of the s. e. frontier of Germany against Asiatic hordes gave rise here to a Margraviate, called the Eastern Mark or boundary of the empire, or Ostreich (Austria), the eastern govt.; which, being united in 1156 to the country above the Ens, was raised to a duchy. After coming, 1282, into the possession of the house of Hapsburg (q.v.), it rapidly rose to a powerful state. The princes of that house extended their dominion by marriage, purchase, and otherwise, over a number of other states, and from 1438 held almost uninterruptedly the throne of the German empire. By the acquisition (1526 and '27) of the crowns of Bohemia and Hungary, the House of A. rose to the rank of a European monarchy. In 1804, Francis declared himself hereditary Emperor of A., and, two years afterwards, laid down the title of Emperor of Germany and King of the Romans.

In the earliest times, what is now the Duchy of A. was inhabited by the Taurisci, a Celtic people; but their name subsequently disappeared before that of the Norici. After the conquest of the Norici by the Romans (B.C. 14), the country to the n. of the Danube belonged to the kingdom of the Marcomanni (q.v.); on the s. of the river lay the Roman provinces of Noricum and Pannonia, in which last was the municipal city of Vindobona (Vienna). Tyrol formed part of Rhætia. All these boundaries were swept away by the irruption of the northern peoples; and the regions in question were occupied in succession, during the 5th and 6th c., by Boii, Vandals, Goths, Huns, Lombards, and Avari. After the Lombards had settled in Italy, the Ens came, about 568, to be the boundary between a tribe of German origin and the Avari, a people who had penetrated thither from the east. The Avari having, 788, crossed the Ens, and fallen upon Bavaria, then part of the Frankish empire, Charlemagne drove them back (796) as far as the Raab, and united the district from the Ens to that river with Germany, under the name of the East Mark, Marchia Orientalis, or Austria. He sent colonists, mostly Bavarians, into the new province, and appointed over it a margrave. It came into the possession of the Hungarians in 900, but was reconquered by Otto I., 955, and reunited with Germany.

As margrave of the reconquered province, the emperor,

* As the history of A. and its rulers involves, for many centuries, the main strand of the thread of European history, it is given at somewhat more than the usual length.

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983, appointed Leopold of Babenberg (q.v.), whose dynasty ruled A. for 260 years. Under Henry Jasomirgott (1141-77), the Mark above the Ens was annexed to the Lower Mark, the united province raised to a duchy, and important privileges conferred on the newly named duke and his heirs. This Henry Jasomirgott took part in the second crusade; he also removed the ducal residence from Leopoldsberg to Vienna, now first called a city, and began the building of the cathedral of St. Stephen. Under his successors, numerous additions (Styria, Carniola) were made to the possessions of the house. Leopold VI. undertook numerous expeditions against the Hungarians and the infidels, and is reckoned the best of the Babenberg princes. The line became extinct with his successor, Frederic, who fell in battle with the Magyars (1246).

Then followed an interregnum, 1246-82. The Emperor Frederic II. at first treated the duchy as a lapsed fief of the empire; shortly, claims were set up by Count Hermann of Bavaria, who was married to a niece of the deceased margrave, Frederic; and when Hermann died, and the empire was distracted by the contests between rival emperors, the 'States' of A. and Styria chose Ottokar, son of the Bohemian king, as duke, who made good his nomination about 1260. Ottokar, refusing to acknowledge Rudolf of Hapsburg as emperor, was defeated, and lost his life and possessions, in the battle of Marchfeld (1278); and the emperor shortly afterwards (1282) conferred the duchies of A., Styria, and Carinthia on his son Albrecht.

The accession of the Hapsburg dynasty with Albrecht I. (q.v.) was the foundation of A.'s subsequent greatness. The despotic Albrecht contended successfully with Hungarians and Bavarians, but while attempting to subdue the Swiss, he was murdered near Rheinfelden (1308) by his nephew, John of Swabia, whom he had deprived of his hereditary possessions. Of his five sons, Frederic was chosen (1314) by a party to the imperial throne, but was defeated (1322) by his rival, Ludwig of Bavaria. Duke Leopold was defeated at Morgarten (1315) in his attempt to reduce the Swiss cantons that had thrown off their allegiance to Albrecht I. At last, by the death of all his brothers, Albrecht II. reunited the Austrian possessions, increased by various additions. After his death (1358), two sons, Rudolf and Albrecht III., successively followed in the duchy of Austria. Another son, Leopold, held the other lands, but lost his life at Sempach, in seeking to regain the Hapsburg possessions in Switzerland. The posterity of Albert and Leopold formed the two lines of A. and Styria. During Albrecht III.'s reign, Tyrol and other districts were ceded to Austria. After his death (1395), the dukedom was held by his son, Albrecht IV. Albrecht V., who succeeded his father, 1404, by marrying the daughter of the Emperor Sigismund, succeeded (1438) to the thrones of Hungary and Bohemia, and was at the same time raised to the dignity of German Emperor, as Albrecht II. With his death, in 1439, Bohemia and Hun-

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gary were for a time lost to the house of A., as were also, after a bloody struggle, the last of the family possessions in Switzerland. But the imperial dignity was henceforth uninterruptedly held by them. With Ladislaw, Albrecht's son, the Austrian line of the House closed (1457), and their possessions went to the Styrian line. Of this line was the Emperor Frederic III., who raised the dignity of his house by making A. an archduchy. After the death of Ladislaw and of his own brother, Albrecht, Frederic came into the undivided possession of the archduchy (1464).

His son, Maximilian I., by marrying Maria, daughter of Charles the Bold, acquired (1477) the Netherlands. Becoming emperor on the death of his father (1493), he ceded the government of the Netherlands to his son Philip. Under Maximilian, Tyrol fell again to the chief branch of the House of A., several districts were acquired from Bavaria, and fresh claims were established on Hungary and Bohemia. The court of Vienna began to be the seat of German art and science. The marriage of the emperor's son Philip with Johanna of Spain set the House of Hapsburg on the throne of Spain and the Indies. Philip died 1506; and on the death of Maximilian I., 1519, Philip's son, Charles I. of Spain, was elected German emperor as Charles V. (q.v.). Charles resigned by treaty all the German possessions, except the Netherlands, to his brother, Ferdinand I. (q.v.).

Ferdinand I. had married the sister of Lewis II. of Hungary; and on the death of the latter in the battle of Mohacz (1526), he claimed the kingdoms of Hungary and Bohemia, with Moravia, Silesia, and Lausatia. His claim was contested by John Zapolya, who secured the aid of Sultan Soliman II.; and Ferdinand, after contests extending over 20 years, had finally to pay an annual tribute of 30,000 ducats to Soliman for possession of Lower Hungary. Ferdinand was fain also to surrender Würtemberg to Duke Ulrich (1534), on condition of its reverting to A. on the death of the male line. Nevertheless, the possessions of the House of A. (in the German line) were at this time already of the extent of 110,000 sq. m. On the abdication of Charles V. (1556), Ferdinand succeeded to the imperial dignity; he died 1564, with the reputation of a good ruler, though he was strongly conservative of everything established, and introduced the Jesuits.

In the partition of the inheritance among his three sons, the eldest, Maximilian II., received the imperial crown with A., Hungary, and Bohemia; the second, Ferdinand, Tyrol and Upper A.; the third, Karl, Styria, Carinthia, etc. Maximilian was more fortunate in Hungary than his father. The death of Soliman before Szigeth (1566) led to a truce; Maximilian procured that his eldest son Rudolf should be crowned king of Hungary 1572, and shortly afterwards of Bohemia, and chosen king of Rome. But his attempt to bring the crown of Poland into his house failed. Maximilian II. was fond of peace, tolerant in religion, and a just ruler. He died 1576; and of his five sons, the eldest, Rudolf II., became emperor. Under him, the possessions of the Archduke Ferdinand of Tyrol, who had married Philippine Welser

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(q.v.), the beautiful daughter of an Augsburg burgher, reverted to the other two lines, Ferdinand's children not being considered noble. Rudolf II. adhered to the old feudal usages, and was a negligent sovereign, leaving everything to his ministers and the Jesuits. His war with the Porte and Transylvania brought him little credit; and the Protestants of Bohemia, oppressed by the Jesuits, extorted from him a charter of religious liberty. At last he was compelled, 1608, to cede Hungary, and 1611, Bohemia and A., to his brother Matthias (q.v.). Matthias, who became emperor 1612, concluded a 20 years' peace with the Turks, and ceded (1617 and '18) Bohemia and Hungary to his cousin Ferdinand, son of the Archduke Karl of Styria, third son of Maximilian II. Matthias lived to see the outbreak of the Thirty Years' War (q.v.), and d. 1619, March 20.

Bohemia refused to acknowledge his successor, Ferdinand II. (q.v.), to whom all the Austrian possessions had reverted, and chose the elector palatine, Frederic V., the head of the Protestant union, as king. The States of A. and the Hungarians also were refractory. But the battle of Prague (1620) subjected Bohemia to Ferdinand; who formally set about rooting out Protestantism in that country and in Moravia, annulled their right of electing their king, and the patent of religious freedom granted them by Rudolf II., and set up a Rom. Cath. reformation tribunal which drove thousands into exile. The emperor also succeeded in extorting acknowledgment of his sovereignty from the States of A., among which Protestantism predominated; after which Protestantism was rigorously prohibited. Hungary also was at last compelled to yield, which had revolted under the Prince of Transylvania. But this religious war and persecution cost the House of A. the life-blood of its possessions. Of 732 cities in Bohemia, only 130 were left; of 30,700 villages, only 6,000; of 3 million inhabitants, only 780,000. Under Ferdinand's successor, the Emperor Ferdinand III. (1637-57), A. continued to be a theatre of war; and at the peace of Westphalia (1648) had to cede Alsace to France. Ferdinand III.'s son and successor, Leopold I., provoked the Hungarians to rebellion by his severity. Tekeli (q.v.) received aid from the Porte, and Kara Mustapha besieged Vienna (1683); which was rescued only by an army of Poles and Germans under John Sobieski hastening to its assistance. The emperor's generals now reduced the whole of Hungary, which was declared a hereditary kingdom in the male line (1687). Prince Eugene compelled the Porte (1699) to restore the country between the Danube and Theiss, and, in 1718, to cede other important provinces to Hungary. The struggle between Leopold and Louis XIV. of France for the heirship to the king of Spain, led to the war of the Spanish Succession (q.v.), during which Leopold died, 1705, May 5. He was of sluggish, phlegmatic character, and wholly under the influence of the Jesuits.

His eldest son and successor, the enlightened Joseph I. (q.v.), continued the war. He died childless, 1711, Apr. 17., and was succeeded by his brother, Karl VI. The peace of Utrecht concluded under his reign (1713) secured to A. the

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Netherlands, Milan, Mantua, Naples, and Sicily. The monarchy now embraced 190,000 sq. m., with 29 million inhabitants, and had a revenue of 14 million florins, with an army of 130,000 men. Its strength, however, was soon much exhausted by fresh wars with France and Spain. At the peace of Vienna (1737), Karl VI. had to give up Naples and Sicily to Don Carlos of Spain, and part of Milan to the king of Sardinia; receiving only Parma and Piacenza instead. He also lost at the peace of Belgrade (1739) nearly all the fruits of Eugene's conquests, giving back to the Porte, Belgrade, Servia, and the parts of Wallachia and Bosnia that had belonged to Austria. The emperor conceded all these points with the view of securing adhesion to the Pragmatic Sanction (q.v.), which conferred the succession on his daughter, Maria Theresa.

With his death (1740, Oct. 20) the male line of the Hapsburgs was extinct, and Maria Theresa, who was married to Franz Stephan, Duke of Lorraine, assumed the government. But counterclaims were raised on all sides, and a violent war arose, in which England alone sided with Maria. Frederic II. of Prussia conquered Silesia. The Elector of Bavaria took the title of Archduke of A., was crowned King of Bohemia at Linz and Prague, and elected emperor as Karl VII. (1742). The Hungarians alone stood by their heroic queen; who, at the peace of Breslau (1742), was forced to yield Silesia to Prussia. Frederic renewed the war by coming to the assistance of the emperor; but Karl dying (1745), Maria Theresa's husband was elected German emperor as Franz I. A second treaty of peace (1745) secured Silesia anew to Prussia; and at the peace of Aix-la-chapelle (1748), A. had to cede Parma, Piacenza, and Guastalla to Don Philip of Spain, and several districts of Milan to Sardinia. These sacrifices secured the existence of the Austrian monarchy; but Maria Theresa wished to recover Silesia, and with this view entered into alliance with France, Russia, Saxony, and Sweden; but after a bloody Seven Years' War (q.v.), Prussia retained Silesia, and A. had spent her blood and treasure in vain. At this time, paper-money first appeared in A., under the name of state-bonds. At Franz's death (1765), his son, Joseph II., became German emperor, and joint-regent with his mother of the hereditary states. Collateral branches of the house of A. were planted by the younger sons of Maria Theresa, the Archduke Leopold in Tuscany, and the Archduke Ferdinand, who married the heiress of Este. See MODENA. In the first partition of Poland (1772), A. acquired Galicia and Lodomeria, and the Bukowina was ceded by the Porte, 1777. At the death of the empress, 1780, the monarchy had an extent of 234,000 sq. m., with a pop. of 24 millions, and a debt of 160 million florins. The administration of Maria Theresa was distinguished by unwonted unity and vigor, both in home and in foreign relations.

Her successor, Joseph II., was an active reformer in the spirit of the enlightened despotism of the times, though often rash and violent in his mode of proceeding. He in-

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roduced economy into every department, remodelled the censorship of the press, granted liberties and rights to Protestants, abolished 900 convents, and revised the school-system. His protective system of duties gave a start to native manufactures. But his reforming zeal and passion for uniformity excited opposition; the Netherlands rose in insurrection, and other disturbances broke out, which hastened his end (1790). He was succeeded in the govt. by his brother, the Grand Duke of Tuscany—as German emperor, Leopold II.—who succeeded in pacifying the Netherlands and Hungary. Peace was concluded with Prussia and Turkey (1790). The fate of his sister, Marie Antoinette, and her husband, Louis XVI., led Leopold to an alliance with Prussia; but he died (1792, March 1) before the war with France broke out. The war was declared by France on his son Franz II., the same year. See FRANCE. By the treaty of Campo Formio (q.v.), 1797, A. lost Lombardy and the Netherlands, receiving in lieu the Venetian territory; two years later, at the second partition of Poland, it was augmented by West Galicia. Franz, in alliance with Russia, renewed the war with France, 1799, which was ended by the peace of Luneville. It is needless to follow all the alterations of boundary that the Austrian dominions underwent during these wars. The most serious was at the peace of Vienna (1809), which cost A. 42,000 sq. m. of territory, and 11 million florins of her revenue. It was in 1804, when Napoleon had been proclaimed Emperor of France, that Franz declared himself hereditary Emperor of Austria, uniting all his dominions in one empire. On the establishment of the Confederation of the Rhine, he laid down the dignity of German emperor, which his family had held for nearly five hundred years, and now took the title of Franz I., Emperor of Austria.

The humiliating peace of Vienna was followed (1809) by the marriage of Napoleon with the Archduchess Maria Louisa; and 1812, March, Napoleon and Franz entered into alliance against Russia. But when the Russian campaign of 1812 had broken the power of the French emperor, his father-in-law declared war on him (1813, Aug.), and joined the alliance of England, Russia, Prussia, and Sweden. The active part which the Emperor Franz now took in the downfall of Napoleon, his consenting to the banishment of his son-in-law to Elba, and the firmness with which he signed the declaration of outlawry against him on his return to France, and contributed to his final overthrow, thus deciding the fortunes of his own daughter and her son—all furnished grounds of claim to that full indemnity for her losses which A. obtained at the close of the war. In the remodelling of the map of Europe that took place at the Congress of Vienna (1815), 32,000 sq. m. were added to the 253,000 possessed by A. after the last partition of Poland, besides the advantages she gained in point of compactness, and facilities for trade, especially by the acquisition of Venice and Dalmatia. Ferdinand, the emperor's uncle, was also restored to the grand duchy

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of Tuscany, of which he had been dispossessed by Napoleon.

After that time, A. exerted a powerful influence in European politics generally, and especially in the German Confederation; and that influence was uniformly hostile to constitutionalism. See METTERNICH. When the Polish revolution broke out, a strict neutrality was assumed; but a Polish corps that was driven into the Austrian territories was disarmed, and sent into Hungary, while a Russian division that had taken refuge on Austrian soil was let go, and equipped with the Polish weapons.

The death of Franz I. (1832, March 2) made little alteration in the policy of A.; Ferdinand I. trod in his father's footsteps. The political alliance with Russia and Prussia was drawn closer by a personal conference of the emperor with Nicolas I. and Frederic William III. at Tep-litz, 1833, Oct. The calm was interrupted, 1840, by the war against Ibrahim Pacha in Syria, in which A. took part in union with England. An attempt at insurrection in Italy in 1844 was a complete failure.

But under this long-continued peace and superficial calm, the internal condition of the empire was coming to a crisis. The stifling bureaucratic system of government and police supervision had produced only irritation and discontent, and was powerless to compress the fermentation. The opposition in the several nationalities became stronger and stronger, and the tactics of playing these nationalities off against one another no longer succeeded. The Polish insurrection, which led to the incorporation of Cracow with the monarchy (1846, Nov.), had turned into a frightful rising of the peasantry in Galicia against the nobles. This enabled the government to overpower the political rising; but the success only increased the danger of the crisis, by encouraging it to proceed in the old reckless way. In the mean time the opposition to Austrian rule in Italy, Hungary, and Bohemia was becoming uncontrollable, and even the states of Lower Austria insisted on some control in the management of the state. The revolutionary movement was already in full swing in Italy, when the fall of Louis-Philippe (1848, Feb. 24) shook Europe to its foundations. A host of petitions and addresses was followed, March 13, by a popular movement in Vienna, to which the government and military, after a feeble resistance, succumbed. Metternich resigned, the arming of the citizens and freedom of the press were granted, and the emperor promised to convoke a consultative assembly from all parts of the empire. At the same time, the opposition in Hungary had carried their demand for an independent ministry responsible to the national diet, and the emperor was not in a position to withstand it. On March 22, the insurrection broke out at Milan, and Radetzky, the military commander, was forced to retire on Verona. Venice rose at the same time, and drove out the Austrians.

While the revolution was thus victorious in the provinces, the central authority was in a state of dissolution. The authority passed into the hands of the national guards

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and the students' legion (the *Aula*). A rising of the people (May 15), in support of the Central Committee, formed from the national guards, which the government had attempted to dissolve, compelled its continuance, and also a revision of the electoral law, so as to convert the new diet into a constituent assembly. These proceedings led to the flight of the court to Innsbruck (May 17). An unsuccessful attempt of the govt. to break the power of the 'Aula,' resulted in the appointment of a Committee of Safety, to whose influence the govt. had to submit. A Slavic insurrection broke out in Prague after Easter, which was repressed with bloody severity by Prince Windischgrätz. While the emperor was thus lingering at Innsbruck, leaving Vienna in the power of the populace, and the Hungarians were pursuing an independent course, it was in Italy that the power of A. began to recover itself.

Radetzky had at first been reduced to the maintaining of a defensive position at Verona, against Charles Albert of Sardinia, who had declared war on A. at the outbreak of the revolution, and the forces that came to his aid from Tuscany, Rome, and Naples; and the foreign policy of A. was in such a state of discouragement, that negotiations were entered into under the mediation of Great Britain, offering the Lombards independence on moderate conditions. But in June, Radetzky took up the offensive, reduced in succession Vicenza, Padua, and other cities, and then turning against the chief Sardinian force, defeated it at Custozza (July 25), and drove it from the field. The fruits of the victory were the dissolution of Charles Albert's army, and a truce which again delivered Lombardy to Austria.

In the mean time, the govt. at Vienna was more powerless than ever. The emperor remained at Innsbruck, and the constituent diet was opened, July 22, by the Archduke John, as his representative. But a new crisis was ripening in Hungary. The Croats, under their Ban, Jellachich (q.v.), opposed the predominance of the Magyars, and refused obedience to the Hungarian government, which, under the Batthyanyi-Kossuth ministry, was pursuing a policy almost independent of Austria. Jellachich's resistance was officially condemned by the emperor, and he was threatened with deposition; but, as subsequently appeared, his conduct was secretly approved by the court. The archduke palatine, Stephen, now left Hungary, after a last attempt at conciliation; and the emperor, who had returned to Vienna after repeated invitations, named Count Lamberg commissioner, with the supreme command in Hungary. Lamberg, however, was murdered on the bridge of Pesth (Sept. 28). The Hungarian parliament was now dissolved, and the command given to Jellachich. But the parliament continued its sittings, and appointed Kossuth president of the committee of defense. When the imperial troops now began to march against Hungary, a frightful insurrection broke out in Vienna (Oct. 6), which was attributed to Hungarian instigation. The arsenal was stormed, and the war-minister, Latour, mur-

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dered; the court fled to Olmütz, a committee of safety was appointed, the armed populace organized, and the Polish general, Bem, put at the head of military affairs; while the diet wavered between loyalty and revolution. In the mean time, the military forces had withdrawn, and joined Jellaichich, in order to prevent the Hungarians coming to the aid of the Viennese. Windischgrätz now approached with an army, and declared Vienna in a state of siege. The attack began Oct. 23, and after a resistance of eight days, Vienna surrendered.

Severe measures were then taken; and a number of leaders, among others Robert Blum (q.v.), were condemned and shot. The diet now met at Kremsir, and a new ministry was formed, into which Prince Schwarzenberg, Count Stadion, Bach, Bruck, and others entered. But the vigorous policy thought to be necessary for the restoration, and advocated by the archduchess Sophia, was not responded to by the easy nature of Ferdinand I. Accordingly, the emperor abdicated Dec. 2, as did also the archduke Franz Karl, and the latter's son, Franz Joseph (q.v.), was declared emperor.

In winter, Windischgrätz entered Hungary, and began the Hungarian war. After the encounters at Raab and Babolna, Ofen was besieged (1849, Jan.), and the Hungarians retired beyond the Theiss, and had time to organize themselves under such able leaders as Görgei and Klapka, and to prepare for the struggle of the following summer.

In the mean time, important events took place elsewhere. Radetzky made his rapid and decisive campaign (March 21-23), which by the victory of Novara led to the abdication of Charles Albert, and an indemnification for war expenses from Sardinia of 15 million lire. With the surrender of Venice, which took place in Aug., the subjugation of Italy was complete.

At Kremsir, the diet, proving intraetable, was dissolved, 1849, March 4, and a constitution was granted (*octroyirt*), with two elective chambers, responsible ministers, and other constitutional provisions. In the national assembly at Frankfurt, A. opposed the project of a confederated state under the leadership of Prussia, and managed to thwart the conferring of the empire of Germany on the Prussian king (1849, March).

In Hungary, the Magyars, though the Germans and Slaves within the country itself were hostile to them, began the campaign with decided success. Bem conquered Transylvania in spite of Russian aid; and the rest of the Hungarian army advancing westward in spring, were successful against the imperial forces at Szolnok and Waitzen. Windischgrätz was replaced in the command by Welden, but the imperial cause was not improved. Kosuth's hopes rising, he proclaimed the deposition of the House of Hapsburg, and virtually made Hungary a republic. By May, Pesth and Ofen were again in the hands of the Magyars; and although General Welden was recalled, and the command given to Haynau, there was little

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prospect of success against the Magyars, if a treaty with the czar had not brought the aid of a Russian army under Paskewitsch. The Austrians still suffered several reverses, and the Hungarians performed splendid feats of arms, such as Görgei's victory at Waitzen, and Klapka's sally from Komorn; but from June, the war on the whole began to be more favorable to A., whose forces were well managed by Haynau and Jellachich; and the intervention of the Russians brought an irresistible weight of numbers against the Magyars. After the affairs of Szege-din and Debreczin, Haynau's engagements on the Theiss, and the raising of the siege of Temeswar, it was in vain that Kossuth transferred the dictatorship to Görgei. Görgei, whether from treachery, as the other Magyar leaders maintained, or from necessity, as he himself avers, laid down his arms to the Russians at Vilagos (Aug. 13). The surrender of Komorn, in Sep., completed the subjugation of Hungary, which was treated as a conquered country, and the officers taken in Arad were dealt with by Haynau with a bloodthirsty rigor.

A. was now free to attend to politics, internal and external, and the spirit of the restoration soon showed itself. One important fruit of the revolution was retained—the liberation of the soil from the burdens and trammels of feudalism. All other liberal concessions very soon disappeared. For a time, the forms of the constitution of 1849, March, were retained; but the rigorous military government and the surveillance exercised over the press showed the tendency of things. The fundamental principles of the constitution turned out to the profit only of the Rom. Cath. Church, which freed itself from the *placetum regium*. In the beginning of 1851, Schmerling and Bruck, the liberal element of the ministry, retired; and in Aug., appeared a number of imperial decrees rendering the ministers accountable to the emperor alone. At last, 1852, Jan. 1, it was announced that the constitution and the fundamental rights were abolished, trial by jury set aside, the old press law revived, etc. This was followed by still greater concessions of influence to the clergy. The emperor did not conceal his predilection for absolute military government. All this was effected not without manifestations of discontent. The fires of revolution were still smouldering in Hungary and Italy; and in Lombardy, though still under strict military law, a tumult broke out, 1853, Feb., in which a number of officers and soldiers were stabbed. The finances, too, notwithstanding vigorous measures for improving the material resources of the country, continued in a bad state, so that incessant loans were required to cover the current deficit.

On the confused arena of German politics, the struggle for ascendancy was kept up between A. and Prussia. In 1850, Oct., the two powers were armed and ready to come to blows; but the bold and determined policy of Schwartzberg prevailed, and Prussia gave way. The points in dispute it might be difficult for any but a German to understand, even if they were worth the attempt. See GER-

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MANY: HESSE-CASSEL. The result was that Prussia's scheme of a union was given up, and also A.'s admission with all her territories into the German Confederation; and in 1851, the old diet was restored. After the death of Schwartzemberg the foreign policy of A. was more conciliatory, and her interference in German affairs less dictatorial. Prussia and A., after 1852, Dec., were more friendly, on the whole, though the war in Italy gave rise to considerable ill-feeling between the two powers. In 1853, Feb., a commercial treaty was concluded, which was of the utmost consequence to the prosperity of A., as removing a great part of the obstructions to her commerce with the rest of Germany.

In 1853, a difference took place between A. and Turkey, a prelude to the war in the Crimea. In the quarrel between the Montenegrines and the Porte, A. took the part of the Montenegrines; she had also complaints as to the infringement of rights possessed by her on the Adriatic coast, and regarding the treatment of Christians in Turkey. The threatening mission of Count Leiningen, 1853, Feb., procured redress of these grievances. As if following up this movement, Russia came forward as the special protector of the Greek Christians of the Ottoman empire, and made demands on the Porte which were held inconsistent with the sultan's sovereign rights. It was the interest of A., as well as of the rest of Europe, to maintain the integrity of the Ottoman empire; but although she united with England and France in endeavoring to settle the question by negotiation, when the war broke out her peculiar relations to Russia led her to remain neutral.

The conduct of A. in Italy, especially after 1849, was such as to make that country a 'standing menace to Europe.' The government of A. in that portion of Italy of which she obtained possession by the treaty of 1815, was far from satisfactory; but what was chiefly complained of by the other powers was her interference in the affairs of the independent states of the peninsula. By means of secret treaties (copies of which were laid before the British houses of parliament, 1859), A. obtained a most undue influence in Parma, Tuscany, Modena, the States of the Church, and in the kingdom of the Two Sicilies. That influence was of course exercised in the interests of despotism, and in opposition to the welfare of the people, whose wishes their rulers, backed by Austrian troops, were enabled to set at defiance. The position of A. in Italy was canvassed at the meetings which followed the signing of the treaty of peace at Paris, 1856, but nothing resulted from the discussions. Sardinia seeing herself gradually environed by, and afraid to fall a victim to, the prevailing Austrianism, after all remonstrances of a peaceful kind had failed, began to arm. A. demanded her immediate disarmament, on pain of war; but Sardinia, whose army was swelled with volunteers from every part of the peninsula, and having previously entered into a treaty, offensive and defensive, with France, refused. A. accordingly commenced hostilities by crossing the Ticino, 1859, Apr. 29.

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On May 3, France, as the ally of Sardinia, formally declared war against A.; but in anticipation of what was to follow, she had several days before despatched troops into Piedmont. The Austrian troops were beaten in every engagement that followed, and so effectually, that on July 6, the emperor, who latterly had taken the chief command of his army, was fain to conclude an armistice with the Emperor Napoleon, who also commanded in person. On the 12th of the same month, the two potentates met at Villafranca, and agreed to terms of peace, the chief conditions of which were to be the cession of Lombardy to Sardinia. See ITALY. In 1866, a short and bloody war occurred between A. on the one hand, and Italy and Prussia on the other (see GERMANY), issuing in the cession of Venice to Italy, and the dual reorganization of the empire as described above. Since then, the Slavonic Bohemians have continued to struggle in vain for the separate crown rights of their ancient kingdom. The part taken by the govt. in the Russo-Turkish war of 1877-8, which led to the occupation of Bosnia and Herzegovina, provoked bitter feeling in Hungary. A secret alliance with Germany against Russia was published 1888.

AUSTRIAN, a. *aws'trĭ-ăn*: of or from Austria.

AUTARCHY, n. *aw'târ-kĭ* [Gr. *autarchia*, absolute power—from *autos*, self; *archo*, to rule]: the government of a single person; absolutism.

AUTERFOIS, adv. *aw'têr-fwaw* [Norm. Fr. *auter*; *fois*, time: Fr. *autrefois*]: before; previously; in *law*, used especially in the phrases *A. acquit*, previously acquitted, *A. convict*, previously convicted, and *A. attaint*, previously attainted. Any one of these three pleas, if substantiated, will prevent an indictment from being proceeded with, on the ground that one should not be tried twice for the same offense.

AUTEUIL, *ô-têl'*: formerly a country village at the entrance of the Bois de Boulogne, now inclosed within the fortifications of Paris. It is known as the residence of famous literary men—such as Boileau and Molière.

AUTHENTIC, a. *aw-thĕn'tĭk*, or AUTHEN'TICAL, a. *-tĭ-kăl* [F. *authentique*, authentic—from L. *authen'ticus*, original: Gr. *authen'tēs*, the real author of any act—from *auton entos*, that sets himself about his own business—*lit.*, trustworthy as coming from the author]: not false; being what it professes to be; not a fiction; genuine. It is frequently employed as synonymous with *genuine*, though a distinction has been drawn, especially by biblical critics, between the two words. *Authenticity*, it is said, refers to the statements made by an author; *genuineness*, to the authorship itself. Thus, we speak of a *History of England* as A., when the narrative is admitted to be correct; and we say of such and such a gospel or epistle that it is *genuine*, when we are convinced that it is the composition of the writer to whom it is attributed. See Bp. Watson's *Apolo-ogy for the Bible*, and Dean Trench's *Study of Words*. Unfortunately, however, for the value of the distinction,

AUTHENTICS—AUTOBIOGRAPHY.

some authors use the words precisely in the converse way, calling that *authentic* which Bp. Watson called *genuine*. AUTHEN'TICALLY, ad. -tĩ-kāl-ĩ, or AUTHEN'TICLY, ad. -tĩk-lĩ. AUTHENTICATE, v. *aw-thěn'tĩ-kāt*, to establish by proving the author; to prove to be genuine or true. AUTHEN'TICA'TING, imp. AUTHEN'TICA'TED, pp. AUTHEN'TICA'TION, n. -kǎ'shǔn, the act of proving by authority. AU'THENTIC'ITY, n. -tĩs'ĩ-tĩ, or AUTHEN'TICNESS, a. -tĩk-něs, correctness as to facts or authority; the not being false; reality; truth. AUTHEN'TICALNESS, n.

AUTHENTICS, n. pl. *aw-thěn'tĩks* [F. *authentiques*]: an anonymous but valuable collection of the Novels or New Constitutions of Justinian.

AUTHOR, n. *aw'thěr* [Fr. *auteur*—from L. *autōrem* or *auctōrem*, an author, an originator—from *augěō*, I increase or make to grow: OE. *auctour*]: one who creates or produces; a writer of a book, a poem, or an article. AUTHORESS, n. fem. *aw'thěr-ěs*, a woman who. AUTHORITY, n. *aw-thőr'-ĩ-tĩ*, legal power; the legal right to exercise power of any kind; rule; influence; credit. AUTHOR'ITIES, n. plu. -tĩz, persons in power; original and contemporary books quoted. AUTHORITATIVE, a. *aw-thőr'-ĩ-tǎ'tiv*, having an air of authority; positive; peremptory. AUTHOR'ITA'TIVELY, ad. -lĩ. AUTHOR'ITA'TIVENESS, n. the quality of being authoritative. AUTHORIZE, v. *aw'thor-iz*, to empower; to make legal; to justify. AU'THORI'ZING imp. AU'THORIZED, pp. -rĩzd. AU'THORIZA'TION, n. -zǎ'shǔn, the act of empowering or giving authority to. AUTHO'RIAL, a. pertaining to an author. AU'THORLESS, a. AU'THORLY, ad. like an author. AU'THORSHIP, n. the condition or state of being an author.—SYN. of 'author': writer; penman; scribe; beginner; former; creator; originator; cause; composer;—of 'authoritative': imperative; imperious; commanding; determinative; positive; dictatorial; peremptory;—of 'authority': jurisdiction; dominion; government; testimony; witness; precedent; credibility; influence; rule; credit;—of 'authorize': to commission; empower; warrant; justify.

AUTHOTYPE, n. *aw-thǒ tip'* [Eng. *autho(r)'*?; *type*—from Gr. *tupos*, a blow]: a type or block containing the facsimile of an autograph, for use on a franked letter, a package of goods, or anything similar.

AU'TO: the Greek pronoun *self*; entering into many compound scientific terms of Greek extraction. In some compounds it denotes the agent or subject, as in *autocrat*, *automaton*, *autonomy*; in others, the object, as in *autobiography*, *autocratic*, *autodidactic*; in others, again, a mere reference to the subject, as in *autochthonous*. This variation in the grammatical relation of A. sometimes occasions ambiguity in the meaning of the compound. Thus, *autograph* means both a machine that writes of itself, and also a writing done with the person's own hand; *autocracy*, both the mastery over one's self, and the sole rule or absolute authority over a people or state.

AUTOBIOGRAPHY, n. *aw'tō-bĩ-ǒg'rǎfĩ* [Gr. *autos*, himself; *bios*, life; *grapho*, I write]: a life written by the indi-

AUTOCHRONOGRAPH—AUTO-DA-FÉ.

vidual himself. AU'TOBI'OGRAPH'IC, -*ĭk*, or AU'TOBI'OGRAPH'ICAL, a. -*ĭ-kāl*, pertaining to. AU'TOBI'OGRAPH'ICALLY, ad. -*lĭ*. AUTOBIOG'RAPHER, n. -*fēr*, one who writes his own life.

AUTOCHRONOGRAPH, n. *aw-tō-krōn'ō-grāf* [Gr. *autos*, self; *chronos*, time; *graphē*, that which is delineated, painted, or written]: an instrument which of itself records time.

AUTOCHTHON, n. *aw-tōk'thōn* [Gr. *autochthon*, from the soil itself—from *autos*, self; *chthōn*, earth, land]: one supposed to spring from the soil he inhabits; an aboriginal; that which had its origin in a country. AUTOCH'THONAL, a. -*thōn-āl*, or AUTOCH'THONOUS, a. -*thōn-ūs*, indigenous; aboriginal.

AUTOCRACY, n. *aw-tōk'rä-sĭ* [F. *autocrate*, an autocrat—from Gr. *autōkrātēs*, having power of himself—from Gr. *autos*, self; *krātos*, power—*lit.*, self-derived power]: government residing in a single person; supremacy; uncontrolled authority; government in which the sovereign unites in himself the legislative and the executive powers of the state, and thus rules uncontrolled. Nearly all eastern governments are of this form. Among European rulers, the emperor of Russia alone bears the title of Autocrat, thus signifying his constitutional absoluteness.—Kant used the word A. in philosophy, to denote the mastery of the reason over the rebellious propensities—the self-government of the soul. AUTOCRAT, n. *aw'tō-krāt*, a sovereign exercising absolute power; a title applied to the emperors of Russia. AUTOC'RATRIX, n. fem. -*trĭks*, or AUTOC'RATRICE, n. -*trĭs*, a woman who: AU'TOCRAT'IC, a. -*ĭk*, pert. to; also AU'TOCRAT'ICAL, a. -*ĭ-kāl*, or AUTOCRATOR'ICAL. AU'TOCRAT'ICALLY, ad. -*krāt'ĭ-kāl-ĭ*. AU'TOCRAT'ICALNESS, n. the quality of being an autocrat.

AUTO-DA-FÉ, n. *aw'tō-dä-fä'* [Port., an act of faith]: the solemn public act that from 1481 was performed in Spain and Portugal at the execution of heretics condemned to death by the Inquisition (q.v.). It was generally held on a Sunday between Whitsunday and Advent, very often on All-saints' Day. At dawn, the dismal tolling of the great bell of the high church gave the signal to begin the drama of the day; for as such it was looked upon by the people, who thronged to it in troops, believing that they did a good work in merely looking on. Men of the highest rank reckoned it prudent to give their countenance to the 'holy' tribunal at these processions, and even grandees of Castile did not disdain to make themselves familiars of the Inquisition. The procession was led by the Dominicans, carrying the flag of the Inquisition; next followed the penitents, on whom only penance had been laid; behind them, and separated by a great cross which was borne before, came those condemned to death—barefoot, clad in the sanbenito, and with a pointed cap on the head; then, effigies of the fugitives; and lastly, the bones of dead culprits, in black coffins painted with flames and hellish symbols. The frightful train was closed by the army of priests and monks. The procession went through the principal

AUTODYNAMIC—AUTOGRAPH.

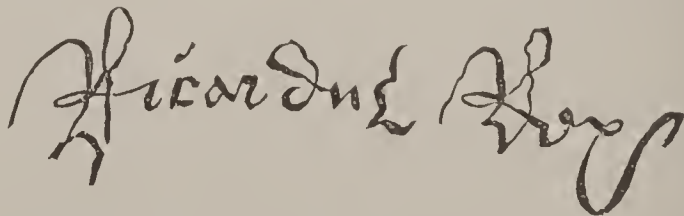
streets to the church; where, after a sermon on the true faith, the sentence was announced. In the mean time, the accused stood before a crucifix with extinguished torches in their hands. After the sentence had been read to them, an officer of the Inquisition gave each of the condemned a blow on the breast with his hand, as a sign that they were given over by that tribunal to the secular power; on which a secular officer took them in charge, had them fettered, and taken to prison. A few hours afterwards they were brought to the place of execution. If they yet, at the last, made profession of the Rom. Cath. faith, they were so far favored as to be first strangled; otherwise, they were burned alive, and with them the effigies and bones of the fugitive and dead culprits. As a rule, the king with his whole court had to exalt by his presence the solemnity of the horrid transaction. The most splendid *Auto-da-fé* took place at Madrid, under Charles II., 1680; the last was held as recently as towards the middle of last century.

AUTODYNAMIC, a. *aw-tō-dī-nām'ik* [Gr. *autos*, self; *dunamikos*, powerful—from *dunamis*, power, strength]: operating by its own power or force without extraneous aid.

AUTOGENEAL, a. *aw'tō-jē'nĭ-ăl*, or **AUTOGENOUS**, a. *aw-tōj'ĕ-nŭs* [Gr. *autog'enēs*, self-created—from *autos*, self; *gennāō*, I produce or generate]: self-begotten or self-generating. **AUTOGENOUSLY**, ad. *aw-tōj'ĕn-ŭs-lĭ*, spontaneously.

AUTOGRAPH, n. *aw'tō-grăf* [F. *autographe*—from Gr. *autos*, self; *graphē*, writing]: a person's own handwriting. **AUTOGRAPH'IC**, a. *-ik*, or **AUTOGRAPH'ICAL**, a. *-ĭ-kăl*, pertaining to. **AUTOGRAPH'ICALLY**, ad. *-lĭ*. **AUTOGRAPHY**, n. *aw-tōg'ră-fi*, a process in lithographic printing, by which a writing or drawing is transferred from paper to stone; the original of a treatise.

AUTOGRAPH: a term applied to what is written with the person's own hand, and not by an amanuensis. In relation to manuscripts, it is used in opposition to a *copy*. The collection of autographs has, especially in recent times, become an object of eager pursuit, and consequently they form a branch of literary trade. Their value is determined by the interest felt in the writer, the scarcity of such relies of him, and the contents of the writing. Besides portraits of famous persons, it is sought to possess



Signature of Richard III. (Ricardus Rex).
From the Paston Letters.

a specimen of their handwriting, or at least their signature, as the peculiarity of the style—the physiognomy of the handwriting—adds to the knowledge of their personal-

AUTOLYCUS—AUTOMATON.

ity. Lithography is particularly serviceable in this matter, not only by supplying fac-similes for biographical and historical works and for portraits, but also by multiplying impressions of collected autographs, such as have appeared in England by Smith, in Holland by Nathan, and in Germany by Dorow. But deserving mention before all others are the *Isographie des Hommes Célèbres* (3 vols. Par. 1828–30), to which a supplement appeared 1839; the collection of French autographs by Delpech (1832), and of German by Schlodtmann (3d ed. 1860). There have been works published containing the sign-manuals of distinguished musicians, of the great poets, etc. The autographs of most of the English sovereigns are in Nichol's *Autographs*. See Fontaine, *Manuel de l'Amateur d'Autographes* (1836); and Günther and Schulz, *Handbuch für Autographensammler* (1856). Charavay began in 1862 a periodical called *L'Amateur d'Autographes*.

AUTOLYCUS, *aw-tōl'ī-kūs*: Greek astronomer and mathematician of Pitane in Æolia, about B.C. 330, wrote on the Revolving Sphere, and on the Rising and Setting of the Fixed Stars. Both works, printed in Dasypodius's *Propositiones Doctrinæ Sphericæ* (Strasb. 1572), contain, for the most part, only such propositions of spherical astronomy as can be solved by means of a globe, and indicate that A. was not acquainted with spherical trigonometry.

AUTOMALITE, n. *aw-tōm'ă-lit*, or AUTOMOLITE, *-o-lit* [Gr. *automōlos*, a deserter—alluding to oxide of zinc being present in a mineral not resembling an ore; *lithos*, a stone]: a mineral—a variety of Gahnite; zinc aluminate, of the Spinel group; colors brown, or green to black.

AUTOMATH, n. *aw'tō-măth* [Gr. *autos*, self; *man'thāno*, I learn]: one who is self-taught.

AUTOMATISM: a term used vaguely and confusedly; denoting sometimes a metaphysical theory which attributes to matter a power of moving itself, or starting its own activity; sometimes a theory which asserts that the acts and choices of the human soul are necessitated by forces which leave man without real liberty or moral responsibility: it also indicates sometimes the loss of power of will caused by injury to the brain.

AUTOMATON, n. *aw-tōm'ă-tōn* [Gr. *autom'aton*, self-moving—from *autos*, self; *māō*, I move]: a self-moving figure or machine produced by internal clock-work. AUTOMATA, or AUTOMATONS, n. plu. AUTOMATIC, a. *aw'tō-măt'ik*, or AUTOMATICAL, a. *-ī-kăl*, or AUTOMATAL, a. *aw-tōm'ă-tăl*, or AUTOMATOUS, a. *-tūs*, having power of motion in itself; acting from concealed machinery; self-regulating. AUTOMATICALLY, ad. *-lī*.

AUTOMATON: term applied usually to machinery constructed to represent human or animal actions. The construction of automata has occupied the attention of mankind from very early ages. Archytas of Tarentum is reported, B.C. 400, to have made a pigeon that could fly. Albertus Magnus and Roger Bacon, 13th c., are said—though doubtfully—to have made respectively a porter

AUTOMOBILE CARRIAGE.

to open the door, and a speaking head. In France, in the beginning of the 18th c., a pantomime, in five acts, was represented by actors moved by machinery. The most perfect A. about which there is absolute certainty, was constructed by M. Vaucanson, and exhibited in Paris, 1738. It represented a flute-player, which placed its lips against the instrument, and produced the notes with its fingers in precisely the same manner as a living player. In 1741, M. Vaucanson made a flageolet-player, which with one hand beat a tambourine; and in the same year he produced a mechanical duck, made to conduct itself in every respect like its animated pattern. It swam, dived, ate, drank, dressed its wings, etc., as naturally as its live companions; and, most wonderful of all, by means of a solution in the stomach, it was actually made to digest its food! An A. produced by M. Droz drew likenesses of public characters; and, some years ago, Mr. Faber contrived a figure, exhibited in various places, Edinburgh among others, which, by means of certain keys, was made to articulate simple words and sentences very intelligibly, but the effect was not pleasant. The chess-player of Kempelen was long regarded as the most wonderful of automata. It represented a Turk of the natural size, dressed in the national costume, and seated behind a box resembling a chest of drawers in shape. Before the game commenced, the artist opened several doors in the chest, which revealed a large number of pulleys, wheels, cylinders, springs, etc. The chessmen were produced from a long drawer, as was also a cushion for the figure to rest its arm upon. The A. not being able to speak, signified when the queen of his antagonist was in danger by two nods, and when the king was in check by three. The A. succeeded in beating most of the players with whom it engaged; but it turned out afterwards that a crippled Russian officer—a very celebrated chess-player—was concealed in the interior of the figure. The figure is said to have been constructed for the purpose of effecting the officer's escape out of Russia, where his life was forfeited. So far as the mental process was concerned, the chess-player therefore was not an A.; but great ingenuity was evinced in its movement of the pieces (see *Chambers's Journal*, vol. xii., p. 66). M. Houdin, the celebrated conjurer, was the inventor of some striking automata.—See Hutton's *Mathematical Recreations*; *Memoirs of Robert Houdin*. Lond. 1859.

AUTOMOBILE CARRIAGE—AUTOMOTOR: carriage to be driven on an ordinary road by power contained within its own mechanism; a horseless carriage. The attempt to develop a practical automobile carriage for ordinary use has been brought in recent years to a complete commercial success. In some of the inventions, petroleum or gasoline furnishes the power; in others electricity. Results are as yet unfavorable to the electric motor. The weight of the storage-battery, by which the power must be furnished, is more than four times that of the petroleum or gasoline motor for the same horse-power.

AUTONOMASY—AUTONOMY.

Prof. Trowbridge, of Harvard, after a special examination of electric automobiles in London and Paris, stated that 'the present electrical motor carriage is altogether too heavy, clumsy, noisy, and expensive to be of public use. On smooth, level roads in London and Paris it seemed to do very well, but it cannot get up hills, and it requires enormous power to be practical upon paved streets. An electrical carriage put upon the streets of London to-day as a substitute for an omnibus would weigh about 2,500 or 3,000 pounds or more, and with passengers nearly 5,000 pounds.'

Recent experiments have been along two lines, one the application of power to the cycle, the other the production of steam- or gas-driven carriages. Cycles (often termed 'moto-cycles') driven by petroleum, steam, or electricity have attained a speed more than 60 miles an hour. Gasoline seems as yet to be the most practicable source of power.

The expensiveness of all such vehicles yet invented is a serious hindrance to their general use. It is also the opinion of experts that American roads are not generally good enough to permit the extensive use of automobile vehicles, which require broad, hard, and smooth roadbeds. The rapid improvement of roads in the interest of cyclists is, however, fast diminishing the force of this objection. The manufacture of automobiles in the United States is increasing with great rapidity. According to the census of 1900 there were 109 manufactories, producing 4,192 machines, valued at \$4,899,443. Since then the increase has been such that during the first 8 months of 1902, 300 manufactories produced 19,000 automobiles, valued at \$20,000,000. It is estimated that in the early part of 1903 there were 40,000 automobiles in use in the United States. The cost of building and running automobiles is rapidly decreasing and the simplicity of construction and operation is bringing the machine into common use. Electric automobile cab companies in the large cities with equipment for recharging batteries offer all the inducements of well-organized cab service. Automobiles are used as delivery wagons, ambulances, touring cars, and fire engines. The fastest mile covered by an automobile was made by Henri Fournier in 1901, on Ocean Parkway, Brooklyn, with a 40 horse-power gasoline carriage; time: 51½ seconds or nearly 70 miles per hour.

AUTONOMASY, n. *aw'tō-nŏm'ă-sĭ* [Gr. *autos*, self; *onŏma*, a name]: in *rhet.*, a common name used in the same sense as a proper name—as, he has gone to the *city*, instead of *London*. **AUTONOM'IC**, a *-nŏm'ĭk*, of or pertaining to.

AUTONOMY, n. *aw-tŏn'ŏ-mĭ* [Gr. *auton'ŏmos*, living by one's own laws—from *autos*, self; *nŏmos*, a law]: the power or right of self-government, whether by a nation, or (under certain restrictions) within limited bodies of the same people, such as parishes, corporations, etc.; exercise of national laws and constitution. The term *A.* is used to designate the characteristic of the political condition of

AUTOPHAGI—AUTOTYPE.

ancient Greece, where every city or town community claimed the right of independent sovereign action. The idea of two or more town communities sinking their individual independence, and forming the larger aggregate unity which we understand by a state, seems to have been intolerable to the Greek mind. AUTONOMOUS, a. *aw-tōn'ō-mūs*, under self-government; complete in themselves—applied to perfect plants.

AUTOPHAGI, n. plu. *aw-tōf'ă-jī* [Gr. *autos*, self; *phago*, I eat]: birds whose young can run about and obtain food for themselves as soon as they escape from the egg.

AUTOPHYLLOGENY, n. *aw'tō-fīl ōj'ě-nī* [Gr. *autos*, self; *phyllon*, a leaf; *gennāō*, I produce]: in *bot.*, the state or condition of one leaf growing upon another.

AUTOPLASTY, n. *aw'to-plās-tī* [Gr. *autos*, itself; *plasso*, I form]: the operation by which a part that has been torn away or destroyed is replaced by other parts of the same individual. The operation by which one makes for an individual, deprived of his nose by some accident, a new nose by means of strips of skin detached from his own forehead, is an example of A. In some cases distant portions of the body have been brought together; from the arm, for example, for the restoration of some part of the face. It is well understood, however, that the borrowed part is at first but partially separated; it must for a while remain attached by a strong neck to the place from which it is borrowed, so that life may be maintained in it until the graft may have hold in its new place. This art was practiced in India in remote ages.

AUTOPSY, n. *aw-tōp'sī*, or AUTOPSIA, n. *aw-tōp'sī-ă* [Gr. *autopsiā*, seeing with one's own eyes—from *autos*, self; *opsis*, sight]: seeing a thing one's self; ocular observation; in *med.*, a post-mortem examination. AUTOPTICAL, a. *aw-tōp'tī-kāl*, or AUTOP'SICAL, seeing with one's own eyes. AUTOP'TICALLY, ad. *-lī*.

AUTOTYPE, n. *aw'tō-tīp* [G. *autos*, self; *tupos*, a type or figure]: a peculiar kind of photographic print; usually a picture or portrait. Gelatine, to which bichromate of potash has been added, has the property of being sensitive to light, like paper treated with certain salts of silver, but in a different way. Light renders the bichromated gelatine insoluble, so that by the use of an ordinary photographic negative, a picture can be produced on the gelatine by exposure to light, as in the ordinary photographic printing process. See PHOTOGRAPHY. The picture so obtained is developed by removing with hot water those portions of the gelatine which have not been acted upon. Two groups of processes are founded on this property of bichromated gelatine. In one, the gelatine is used for every copy of the picture; while in the other, it is only used to produce one picture, which is then made by various devices to serve as a printing matrix for throwing off, by mechanical means, many impressions. What is called carbon-printing comes into the first group, and an autotype is one kind of a carbon print. It is produced by simply mixing carbon or other

AUTUMN—AUVERGNE.

pigment with bichromated gelatine, coating a sheet of paper with the mixture, and then exposing it to light under a negative as above described. When no pigment is used, the picture is merely in relief and depression, but the addition of carbon gives it ordinary light and shade, so as to resemble a print in ink. There are some niceties in the manipulation not here detailed. In those processes where the gelatine picture serves only as a matrix, electrotypes, impressions in soft metal, or other kind of reverses, are made, from which impressions can be taken mechanically, in any kind of printing-ink. Photo-galvanography and the Woodburytype belong to this group. AUTOTYPOGRAPHY, n. *aw'tō-tī-pōg'-rū-fī* [Gr. *autos*, *tupos*, and *grapho*, I write]: the process of photographic printing as above.

AUTUMN, n. *aw'tŭm* [L. *autum'nus*, the autumn—from *auctus*, increased, abundant]: the third season of the year, popularly beginning in England with Aug., in the United States with Sep.; but really about Sep. 21, the period when the sun commences to cross the equator in its journey to the Tropic of Capricorn. AUTUM'NAL, a. of or pertaining to autumn.

AUTUN, *ō-tŭn'* (*Bibracte*, *Augustodunum*): town in France, dept. of the Saône-et-Loire, in the Burgundian dist. of Autunois; on the river Arroux. It is the seat of a bishop, and has a fine cathedral. Cloth, carpets, leather, stockings, and paper are manufactured in the place.—The ancient Bibracte was the chief city of the *Ædui*, and had a much frequented Druid school; and later, under the Romans, when it got the name of Augustodunum, it was no less famous for its school of rhetoric. A. was pillaged by the Saracens 725, and nearly destroyed by the Normans 888. There remain many ruins of Roman temples, gates, triumphal arches, and other antiquities. At the Council of A. (1094), King Philip I. was excommunicated for divorcing his queen, Bertha. Pop. of A. (1891) 15,187.

AUTUNITE, n. *aw-tŭn'it* [named because found near *Autun*, France]: an orthorhombic mineral of a citron or sulphur yellow color. The hardness is 2 to 2.5; the sp. gr. 3.05 to 3.19; the lustre on one face pearly, on others adamantine. It is translucent and optically biaxial. Composition: phosphoric acid, 13.40 to 15.09; uranium trioxide 55.8 to 62.24; lime 5.01 to 6.51; water 16.00 to 22.8; some times a little iron. It occurs with albite in Conn. and Mass.; in gneiss near Philadelphia; in mica mines in S. C.; also in S. Dak. and Utah.

AUVERGNE, *ō-vairn'*: southern central dist. of France, before the revolution a separate province, composing almost exclusively the modern depts. of Cantal and Puy-de-Dôme. Between the Allier and the upper course of the Dordogne and the Lot, A. rises into a highland region, having Bourbonnais, Limousin, and Rouergue, as terraces of descent into the w. plains, while on the e. it joins the Cevennes and the s. highlands. Not only do the cone and dome-like shapes of the summits show a volcanic formation, but also the great masses of basalt and trachyte that break through the crust

AUVERNAS—AUXERRE.

of granite and gneiss render it probable that here was a chief focus of plutonic action. Among the summits that have apparently been volcanoes, the most remarkable are Cantal (6,093 ft.), Mont-d'Or (6,188), Puy-de-Dôme (4,806), and Pariou; the latter, adjoining Puy-de-Dôme, is basin-shaped on the top, and one of the finest specimens of an ancient and extinct volcano: all are now covered with verdure. A. has naturally two divisions—Upper A., to the s., and Lower A., to the n.; in which last the valley of Limagne, on the left bank of the Allier, is distinguished for extraordinary fertility. The climate is colder in the mountainous districts than the southern position, with a less elevation, would lead us to expect, and is remarkable for furious winds and violent thunder-storms; but in the deep valleys the heat of summer is often oppressive. The lava-covered plateaus are desert, but the pulverized volcanic earths that cover the slopes and valleys form a rich and fruitful soil, as is shown by the crops of grain, garden produce, fine fruits, wine, abundance of chestnuts in the south, and of walnuts in the north, as well as by extensive thriving forests, with flax and hemp fields and meadow-lands, in the poorer districts. Agriculture is somewhat neglected; but the breeding of cattle, especially of mules, is well managed. A. produces iron, lead, copper, antimony, and coal, and is rich in mineral springs.

The Auvergnese are a highland people, rude in their manners, poor, ignorant, yet honest and kind, though not free from the propensity to revenge. They live by cattle-keeping and agriculture, and many go to Paris as laborers. Domestic manufactures, therefore, remain confined to weaving, tanning, and paper-making. A. has, however, produced distinguished men. It was the native place of statesmen and warriors of the 15th and 16th c.; also of the Arnould (q.v.) family, distinguished in the history of Port Royal and of Jansenism; also, in more recent times, Lafayette and Polignac. Chief towns, Clermont and Aurillac (q.v.). The country derived its name from the Arverni, who long defended their fastnesses against Cæsar, and later against the Goths, Burgundians, and Franks, with whom they at last coalesced.

AUVERNAS, n. *av-vèr'nas* [F. *auvernas*, a name given at Orleans to certain kinds of black raisins]: a heady wine, made near Orleans from the raisins mentioned in the etymology. Kept two or three years, it becomes excellent.

AUXERRE, *ô-sâr* (anc. *Autissiodorum*): chief town of the dept. of Yonne, France; on the Yonne, 90 m. s.e. of Paris; on the slope of a hill, in a rich and beautiful district abounding in vineyards. The city is mostly ill built; but its aspect from a distance is very imposing, the most prominent feature being the cathedral church of St Stephen, which dates partly from the 13th c. The chapter of A. was once one of the richest in France. The churches of St. Germain and of St. Pierre (16th c.) are fine and interesting buildings. There is a curious old clock-tower over a gatehouse, with an ugly skeleton spire of iron bars. The ancient walls of the city have been converted into boulevards. A. was a flour-

AUXESIS—AVA.

ishing town before the Roman invasion of Gaul. It successfully resisted the Huns under Attila, who only ravaged its suburbs. Clovis took it from the Romans. After his death, it became part of the kingdom of Burgundy. The English took it 1359, but it was retaken by Du Guesclin. Charles VII. gave it up to the Duke of Burgundy. It was finally united to the kingdom of France by Louis XI. The principal manufactures are of strings for musical instruments, woolen cloths, hosiery, earthenware, and leather. Pop. (1891) 16,986; (1896) 18,576.

AUXESIS, n. *avg-zě'sis* [Gr. *auxēsis*, increase]: in *rhet.*, a figure by which anything is magnified too much. **AUXETIC**, a. *-ět'ik*, pertaining to.

AUXILIARY, a. *avg-zil'ya-rĭ* [L. *auxiliāriŭs*, bringing aid—from *auxiliŭm*, help—from *auxit*, it has increased]: helping; assisting: N. a helper; an assistant; applied to the verbs, shall, will, may, can, must, etc., as helping to form the tenses of other verbs, and thus performing the same office as inflections in L. or Gr. verbs. **AUXILIARIES**, n. plu. *-ya-rĭz*, foreign troops. **AUXILIAR**, a. *avg-zil'ĭ-ér*, helping. **AUXILIATORY**, *-a to-rĭ*, assisting, helping.

AUXILIARY SCREW: see **SCREW-PROPELLER**.

AUXILIARY VERBS: see **VERBS, CONJUGATION**.

AUXONNE, *ō sōnn'* (*Assonium*, *Ad Sonam*, 'near the Saône'): French town, on the left bank of the Saône, 20 m. s.e. of Dijon; a fortress of the second class. Pop. 5,000.

AVA, *ā'vā*: ruined city of Burmah, of which it has repeatedly been the cap., the honor having been transferred again and again between it and Monchobo, Sagaing, Amarapura, and Mandalay, the present cap. It is in lat. 21° 51' n., long. 95° 58' e.; on the bank of the Irawaddy, here about 4,000 ft. broad. The river at this point receives two affluents; and these, joined by a canal, render the city circumnavigable. The name is a Hindu and Malay corruption of Aengwa or Aæn-ua, meaning *fish-pond*, given it from being built where there were formerly fish-ponds, of which some remain; but in official documents it is designated as Ratnapura, i. e., City of Pearls. The city, which was 8 or 10 m. in circumference, was surrounded by walls and ditches. A. is now almost a desert, having been reduced to ruins by an earthquake in 1839.—On the opposite bank stands Sagaing, which has twice been the seat of government. The united pop. of the three cities of Ava, Sagaing, and Amarapura was at one time est. 400,000.

AVA, *ā'va* or **ARVA**, or **YAVA**, or **KAVA** [native name *Kava*], (*Macropiper methysticum*): plant of the natural order *Piperaceæ* (q.v.), possessing narcotic properties. Until recently, it was ranked in the genus *Piper* (Pepper). It is a shrubby plant, with heart-shaped, acuminate leaves, and very short, solitary, axillary spikes of flowers. It is a native of many of the South-sea islands, where the inhabitants intoxicate themselves with a fermented liquor having the same name as the plant, prepared from its root or (more accurately) rhizome. The rhizome is thick, woody, rugged, and aromatic. A tincture of it is useful in chronic rheuma-

AVADAVAT—AVALANCHE.

tisms. The intoxicating liquor is prepared by macerating it in water. The savage Tahitians were accustomed to prepare it in a very odious manner; much as the Indians of the Andes prepare *Chica* (q.v.) or Maize beer—chewing the root, depositing it in a bowl, straining through cocoa-nut husk, and mixing with water or cocoa-nut milk, after which fermentation speedily ensues. The taste is unpleasant to those unaccustomed to it, and has been likened to that of rhubarb and magnesia. The intoxication is not like that produced by ardent spirits, but rather a stupefaction like that caused by opium. It is succeeded by a copious perspiration. The habitual use of ava causes a whitish scurf on the skin, which among the heathen Tahitians was reckoned a badge of nobility, the common people not having the means of indulgence requisite to produce it.—The leaf of the ava plant is in some places used with the betel-nut, instead of that of the betel-pepper.

AVADAVAT, n. *āv'a-dā-vāt*, or AMADAVAT, n. *am-ād'a-vāt*: an East Indian bird, the *Estrela amandava*. Male: bill carmine-colored; upper parts, brownish-gray before, red behind; lower, whitish, with dashes of red and black; wings dark, covered, as are the sides and posterior parts of the back, with white spots. The female is less highly colored.

AVAIL, v. *ā-vāl'* [L. *ad*, to; *valēō*, I am strong: F. *à, valoir*, to be worth—*lit.*, to be worth]: to turn to advantage; to be of use; to profit; to make use of: N. profit; advantage. AVAIL'ING, imp. AVAILED, pp. *ā-vāld'*. AVAILABLE, a. *ā-vāl'ā-bl*, profitable; that can be turned to advantage. AVAIL'ABLY, ad. *-blī*. AVAIL'ABIL'ITY, n. *-bīl'ī-tī*, or AVAIL'ABLENESS, n. *-bl-nēs*, the power of furthering an object in view.—SYN. of 'avail, n.'; use; benefit; utility; service; usefulness; profit.

AVALANCHE, n. *ā vā-lānsh'* [F. *avalanche* and *avalange*—from *a val*, downwards: L. *ad*, to; *vallem*, the valley]: a vast mass of snow or ice, sometimes with rocks, soil, and trees, sliding or rolling down the declivities of high mountains, often occasioning great devastation. Drift or powder avalanches (*Staub-lawinen*) consist of snow, which, loose and dry from strong frost, once set in motion by the wind, accumulates in its descent, and comes suddenly into the valley in an overwhelming dust-cloud. A. of this kind occur chiefly in winter, and are dangerous on account of their suddenness, suffocating men and animals, and overturning houses by the compression of the air which they cause. Another kind of A. resembles a land-slip. When the snow begins to melt in spring, the soil beneath becomes loose and slippery; and the snow slides down the declivity by its own weight, carrying with it soil, trees, and rocks. The greatest danger is where elevated tracts of moderate declivity are separated from the valleys by precipitous walls of rock; the softened snow of spring beginning to roll or slide on these slopes, is hurled over the precipices with fearful force into the valleys. The very wind caused by its swift descent prostrates forests and houses. Ice A. are those that are seen and heard, commonly in July, Aug., and Sep., thundering down the

A VALE—A VARICE.

steeps, e.g., of the Jungfrau. They consist of masses of ice that detach themselves from the glaciers in the upper regions.

A VALE, v. *ă-vāl'* [F. *avalier*, to descend as a river: F. *aval*, down stream—from L. *avalārē*, to sail down stream—from *ad*, to; *vallem*, a valley]: in *OE.*, to let fall; to depress; to descend; to come down.

AVAL ISLANDS: see BAHREIN ISLANDS.

AVALLON, *ă-vāl-ōn'* (anc. *Aballo*): town of the dept. of Yonne, France, 26 m. s.e. of Auxerre; on a steep hill of red granite, nearly surrounded by the Cousin. A. is a very ancient town of Celtic origin, and has been often besieged and taken. Pop. 5,500.

AVANT-COURIER, n. *ă-vōng'kôr'î-ā* [F. *avant*, before, and *courier*]: a runner; a person sent beforehand to give notice of the approach of another. AVANT-GUARD, n. *-gărd*, the van; the first body of an army.

AVANTURINE, n., or AVENTURINE, n. *ă-văn'tū-rîn* [F. *par aventure*, by accident]: a variety of quartz found in India, Spain, and Scotland, deriving its peculiar play of reflected light and colors from embedded spangles, or by minute particles of mica; a variety of felspar; an artificial mineral far exceeding the natural in brilliancy; a bright brown color.

AVA'RI: tribe of eastern origin, appearing 100 years later than the Bulgarians, in the countries about the Don, the Caspian Sea, and the Volga. One part of them remained in the Caucasus, another part pressed forward (about A.D. 555) to the Danube, and settled in Dacia. Here they served in Justinian's army, and assisted the Lombards to overturn the kingdom of the Gepidæ; and, about the end of the 6th c., under the mighty Khan Bajan, they conquered Pannonia. Later, they made themselves masters of Dalmatia; made devastating incursions into Germany, as far as Thuringia; and into Italy, where they warred with the Franks and Lombards, and extended their dominion over the Slaves living on, and n. from, the Danube, as well as over the Bulgarians as far as the Black Sea. These nations at last rose against them, and in 640 drove them out of Dalmatia. Confined to Pannonia, they were subdued by Charlemagne, and well-nigh extirpated by the Moravians, so that, after 827, they disappeared from history. They usually surrounded their settlements with fortifications of stakes driven into the ground, and earth, of which traces, under the name of Avarian Rings, are yet found in the countries formerly occupied by them. The results of the most recent criticism show that, in all probability, the A. belonged to the same great Turanian stock as the Huns, and that their original residence was the land lying east of the Tobol, in Siberia.

A VARICE, n. *ăv'ă-rîs* [F. *avarice*—from L. *avārit'îă*, an eager desire—from *avārus*, greedy: It. *avarizia*]: an eager greediness of gain; an unbounded desire of getting and possessing wealth; greediness; covetousness. AVARICIOUS, a. *ăv'ă-rîsh'ûs*, greedy of gain; covetous. AV'ARICIOUSNESS,

AVAST—AVE.

n. *-ŭs-něs*, greediness of gain. **AV'ARI'CIOSLY**, *ad.* *-lŭ*.—**SYN.** of 'avaricious': niggardly; covetous; pārsimonious; penurious; miserly; sordid.

AVAST, *int. ad.* *ă-vást'* [perhaps *It. basta*, enough, cease: *Dut. houd vast*, hold fast]: a nautical term—hold; stop; stay: a command to cease from any operation—e.g., 'avast heaving.'

AVATAR, *n.* *ăv'ă-târ'* [*Skr. avatāra*, descent]: the descent of a Hindu deity upon the earth in a manifest shape, either for beneficent or for retributive ends. It resembles in signification the Christian term *Incarnation*. The word **A.** is sometimes rhetorically employed in English literature. The avatars of Vishnu (q.v.) are the most famous in Hindu mythology.

AVA'TCHA, *ă-vă'chă*: a mountain and bay of Kamtchatka. The bay is on the e. coast, being by far the best harbor of the peninsula, and containing the cap. city of Petropaulowsk (q.v.). The mountain, 9,055 ft. in height, is about 20 m. to the n., not far from the sea, lat. 52° 15' n., long. 158° 50' e. It is a volcano with two craters—one at the summit, and the other rather more than half-way up, on the seaward side.

AVAUNT, *int.* *ă-vawnt'* [*F. en avant*, forward! on!—from *avant*, before—from *L. ab, ante*, before]: begone; go forward.

AVE, *n.* *ă'vē* [*L. ōvē*, hail—from *ŏvēō*, I am happy or safe]: **AVE MARIA**, *ă'vē mărĭ'ă*, hail Mary—in Latin, the first two words of the angel Gabriel's salutation to the Virgin Mary (Lk. i. 28): 'Hail, Mary, highly favored, the Lord is with thee; blessed art thou among women, and blessed is the fruit of thy womb.' In this form, according to an ordinance of Gregory I., the invocation was at first said by the priests during mass, on the fourth Sunday after Advent. With the extended worship of the Virgin since the 11th c., the **A. M.** appears as a lay-prayer of nearly equal use with the *Pater Noster*, and was sanctioned as such at the end of the 12th c. Accordingly, not only did Urban IV. (1261) add the concluding words, *Jesus Christus, Amen*, but since the first half of the 16th c., the prayer began to receive, more and more commonly, as an addition to the old formula, what constitutes the conclusion of the modern form: 'Holy Mary, mother of God, pray for us sinners, now and at the hour of our death, Amen.' This prayer, known also as *Angelica Salutatio* (*Angelic Salutation*), is a very common form among Rom. Catholics. An edict of John XXII. (1326), ordains that every Rom. Catholic shall, morning, noon, and evening, at the warning of the bells, repeat three aves. This ringing of bells as a summons to morning, mid-day, and evening prayers, is retained in some Protestant countries, and is still called the *Ave Maria*, or *Angelus Domini*. The aves are reckoned by the small beads of the rosary, which are hence called *Ave Marias*, while the large beads are devoted to the *Pater Noster*. 150 *Ave Marias* form—after the 150 Psalms—a *Psalterium Mariæ*, and are thought to possess high propitiatory power.

AVEBURY—AVENGE.

AVEBURY, *ā'bĕr-ĕh*, or **A'BURY**, or **A'BIRY**: village in Wiltshire, Eng., 6 m. w. of Marlborough, 25 m. n. of Salisbury; on Salisbury Plain, 16 m. from Stonehenge, whose reputation for Druidical remains it shares. Pop. 769.—**A.** is notable as the site of the largest Druidical ruin in Europe, besides numerous barrows and cromlechs. Here, what is supposed to have been a temple, comprises a hundred large stone columns, placed in a circle about a space 470 yards in diameter, with two inner double or concentric circles, one containing 43 and the other 45 upright stones. These stone pillars, or columns, vary between 5 and 20 ft. in height, and 3 and 12 ft. in breadth. The whole enclosure is bounded by a deep ditch and high embankment, in which were originally two entrances to the temple, opening on avenues more than a mile in length, each avenue 35 to 56 ft. in width, and with a row of stone blocks on either side. Three quarters of a m. from the so-called temple, between the two avenues, is a large barrow, or conical mound, called Silbury Hill, 2,027 ft. in circumference at the base, with sloping height of 316 ft. and perpendicular height of 170 ft., the diameter of the top being 120 ft., and the space covered by the entire work more than five acres.

AVEIRO, *ā-vā ē-rō* (anc. *Avreium*): city of Portugal, in the province of Beira, 31 m. n.w. from Coimbra, in an unhealthful situation on the Ria d'Aveiro, a salt lake or lagoon, extending five leagues to the n., and separated from the sea by a narrow bar of sand. **A.** is a bishop's see; it has manufactures of earthenware, but the chief article of trade is salt, made in the sea marshes in summer. Other articles of trade are fish, wine, oil, and oranges. The harbor is wide but shallow. Pop. 7,200.

AVELLA, *ā-vĕl'ġā* (anc. *Abella*): town of central Italy, province of Avellino; 20 m. e.n.e. of Naples. Pop. 4,000.

AVELLINO, *ā-vĕl-lĕ'nō* (anc. *Abellinum*): chief town of the prov. of the same name in the s. of Italy; at the foot of Monte Vergine, on which is the famous monastery founded by S. Guglielmo da Vercelli, on the ruins of a temple of Cybele, 1119. **A.** suffered greatly from earthquakes in 1694, 1731, and 1805. It has manufactures of woollens, paper, macaroni, and considerable trade in corn and hazel-nuts. The *nuces Avellanæ* were famous even in Pliny's time. Between **A.** and Benevento is the Val de Gargano, where the Samnites defeated the Romans A.U.C. 433. Pop. (1901) of town, 23,760; of province, 402,425.

AVE'NA: see **OAT**.

AVENACEOUS, a. *āv'ĕ-nā'shŭs* [L. *āvēna*, oats]: of or like oats. **AVENAGE**, n. *āv'ĕ-nāj*, a stipulated quantity of oats paid as rent, or in lieu of other dues. **AVENIN**, n. *āv'ĕ-nĭn*, the variety of vegetable casein obtained from oats; oat-legumin.

AVENGE, v. *ā-vĕnj'* [OF. *avengier*; F. *venger*, to revenge—*from* L. *vīndīcārĕ*, to avenge]: to take satisfaction for an

AVENGER OF BLOOD—AVERAGE.

injury by justly punishing in some way the person that injures. To REVENGE, is to punish for a real or supposed injury in a malicious or arbitrary manner. AVEN'GING, imp. AVENGED, pp. *ă-věnjd'*. AVEN'GER, n. one who. AVENGEMENT, n. punishment for injury.

AVENGER OF BLOOD: see BLOOD, AVENGER OF.

AVENS, n. *ăv'ěnz* [W. *afans*]: a common wild plant with small yellow flowers; the *Gēum urbānum*, ord. *Ro-sācěæ*; the herb bennet. See GEUM.

AVENTAYLE, AVENTAIL, or AVENTAILLE, n. *av'n-tāl* [OF. *aventail*; It. *ventaglia*—from L. *ventus*, wind]: the part of a helmet which lifts up, and is so contrived as to admit fresh air.

AVENTINE, a. *av'ěn-tīn* [L. *Aventinus*]: pertaining to the Mons Aventinus, one of the seven hills on which Rome was built: N. a military refuge; a tower; a defensive fort; a redoubt.

AVENTINUS, *ăv-ěn-tī'nūs*, or *a-věn-těn'ūs*, JOHANNES THURMAYR: 1476–1534; b. Abensberg, Bavaria: scholar and historian. He studied at Ingolstadt, took the degree of M.A. at Paris, taught Greek and mathematics at Cracow, and poetry and eloquence at Vienna. In 1512, the Duke of Bavaria called him to Munich, and intrusted him with the education of his sons. Here A. wrote his esteemed *History of Bavaria* (*Annales Boiorum*), which occupied him 16 years, and was not published till 20 years after his death, and then only with large portions, about the Roman Church, excised. These, however, were all restored in Cisner's edition of 1580. A. wrote several other learned works.

AVENTURINE: see AVANTURINE.

AVENUE, n. *ăv'ě-nū* [F. *avenue*—from L. *ad*, to; *venĭō*, I come]: a passage; a road to; an entrance into; a walk shaded by trees; in *Amer.*, a wide street.

AVER, v. *ă-vér'* [F. *avérer*, to maintain as true—from mid. L. *advērārě*, to declare a thing true—from L. *ad*, to; *vērus*, true]: to maintain a thing as true; to declare positively; to assert. AVER'RING, imp. AVERRED, pp. *ă vėrd'*. AVER'MENT, n. a positive declaration or assertion.—SYN. of 'aver': to assert; affirm; asseverate; protest; declare; avouch.

AVERAGE, n. *ăv'ěr-āj* [Ger. *haferei*; F. *avarie* or *avaris*; Sp. It. *avaría*—from mid. L. *havāriā*, sea-damage to cargo in transit: Ar. *āwar*, a defect or flaw, damage to merchandise]: formerly applied to the money paid by those who received their goods in safety to indemnify the others whose goods had been thrown overboard in a storm; calculation and distribution of the loss arising from goods thrown overboard; a mean proportion; the mean of any collection of sums, numbers, or quantities, found by dividing the totals by the number of the sums or quantities: ADJ. being in a condition common to many—as a man of *average height*, an *average crop*: V. to make equal to others; to reduce to a level; to proportion. AV'ERAGING, imp. AVERAGED,

AVERAGE.

pp. *āv'er-āj'd*. AVERAGELY, ad. -lī, according to an average.

Note.—Skeat says *average* was anciently a proportionate contribution rendered by a tenant to the lord of the manor in lieu of the service of carrying wheat, turf, etc.; mid L. *averāgġum*, the service due to their lords—from *avēria*, cattle; the average was estimated according to the work done by the *avers* or cart-horses; then it was extended to carriage of goods by ships: *average* is not in early use in literature.

AVERAGE, *āv'ér-āj*: a mean proportion, or intermediate sum. If any number of unequal quantities are given, another quantity may be found of a mean or intermediate magnitude, some of the given quantities being greater, and others less, than the one found, which is called the A. The exact relation is this: that the sum of the excesses of the greater above the A. is equal to the sum of the defects of the less below it. If there are, say, 7 vessels unequally filled with sand, and if we take handfuls from the greater, and add these to the less, until the sand is equally distributed, then any one of the equalized measures of sand is the A. of the 7 unequal measures. If the quantities of sand in the several vessels are stated in numbers, as 5, 10, 12, 8, 11, 14, 3 ounces, the A. is found by adding together the numbers, and dividing by how many there are of them—viz., by 7. The sum being 63, this, divided by 7, gives 9 ounces as the average. The system of averaging is a very important and time-saving one. By averages, the farmer calculates the value of his crops; the grazier, the value of his cattle; and the forester, the value of his trees. Reflection, however, requires to be exercised in striking averages; otherwise, serious errors may be committed. If a farmer, for instance, has three lots of sheep, the first of which he averages at \$25 a head, the second at \$15, and the third at \$9, it might be thought that the A. of the whole stock made up of the three lots would be got by taking the mean of \$25, \$15, and \$9—viz., $\frac{25 + 15 + 9}{3} = £16\frac{1}{3}$. But this would be correct only if there were an equal number of sheep in each of the lots. To get the real A. in case of the lots being unequal, he must multiply the A. of each lot by the number of cattle in it, add the three products together, and divide by the whole number of cattle in all three lots taken together. If we suppose 9 head in the first lot, 20 in the second, and 15 in the third, the A. is $\frac{25 \times 9 + 15 \times 20 + 9 \times 15}{9 + 20 + 15} = \$15$.

AVERAGE, in Marit. Law: proportionate distribution of losses. A rule was established by the Rhodian law (q.v.), and has prevailed in every maritime nation, that where a loss has been sustained, or expense incurred, for the general safety of the ship and cargo, a contribution should be made, in proportion to their respective interests, by the owners of the ship, freight, and goods on board; or, in modern times, by the insurers of these. To this contribution the name of *General A.* is given. The apparel, jewels, and other personal property of the passengers, not

AVER-CORN—AVERNUS.

carried for purposes of traffic, and the seamen's wages and provisions, are not liable for any share in this contribution. Goods thrown overboard are now estimated at the price they would have yielded at the port of delivery at the time, freight, duties, etc., being deducted. See JETTISON. *Particular A.* is the loss of an anchor, the starting of a plank, the leaking of a cask, the loss of goods washed from the deck, or the like, where the common safety was not in question, and where there is, consequently, no contribution. To losses of this description, the term *A.* is generally, though incorrectly applied. *Petty averages* are the duties of anchorage, pilotage, etc. If these occur in the ordinary course of the voyage, they are not loss, but simply part of the expense necessarily incurred. But if they have been incurred in extraordinary circumstances, and for the purpose of avoiding impending danger, they are a loss included in the general *A.*, and covered by the contribution. *A. Bond* is a deed which parties liable to a general *A.* are in the habit of executing, by which they empower an arbiter to value the property lost, and fix the proportion to be borne by each. See ADJUSTMENT in Law.

AVER-CORN, *n.* *ăv-ēr-körn* [so called, according to Skinner, because it is the corn drawn to the granary of the lord of the manor by the working cattle, or *avers*, of the tenants]: a reserved rent in corn, paid by farmers and tenants to religious houses. AVER-LAND, *n.* land plowed by the tenants, with their cattle, or *avers*, for the use of a monastery or of the lord of the soil. AVER-PENNY, *n.* money formerly paid in lieu of arrage and carriage. AVER-SILVER, *n.* a custom or rent so called, originating from the cattle, or *avers*, of the tenants of the soil.

AVER'DANT, *a.* [Eng. *a*; *verdant*]: in *her.*, covered with green herbage. The term is used specially of a mount in base.

AVERDUPOIS': see AVOIRDUPOIS.

AVERELL—AVERNUS.

AVERELL, *ā'vēr-el*, **WILLIAM WOODS**: military officer: b. Cameron, Steuben co., N. Y., 1822, Nov. 5; grandson of Ebenezer A., capt. under Gen. Sullivan in the revolutionary army. Young A. graduated at West Point 1855, June, and until 1861 he was on garrison and frontier duty. He was promoted to first lieut. mounted riflemen 1861, May 14, was in the battle of Bull Run, and served on staff duty about Washington until Aug. 23, when he was appointed col. 3d Penn. cav. He was in the campaigns of the Army of the Potomac during the next two years, but began to gain a special reputation as a daring and able cavalry officer, by his cavalry raids 1863, Mar., in W. Va. Through all that summer he was hunting the Confederates through the country of the Upper Rappahannock, and in Nov. and Dec. with an army of 5,000 men drove them into s.w. Va., cut the Virginia and Tennessee railroad, and destroyed large quantities of supplies. Notwithstanding all the efforts of the Confederates to cut off his retreat from their country, A. succeeded in getting his force through with 200 prisoners and 150 horses. After a brief period of sick leave, he was placed in command of the 2d cav. division, and through 1864 and till 1865, May 18, when he resigned, he was continuously engaged in sharp cavalry raids in the Shenandoah Valley and that vicinity. A. reached the rank of brevet maj.gen. For three years after the war, he was U. S. consul-gen. to the Dominion of Canada; and after that time, pres. of a large manufacturing company. He died 1900, Feb. 3.

AVEREN, n. *āv'ēr-ĕn*, or **AVERIN**, n. *-ĭn* [Welsh, *avan*, a wild strawberry]: a wild strawberry.

AVERILL, *ā'vēr-ĭl*, **JOHN T.**: military officer: b. Alna, Me., 1825, Mar. 1; d. 1889, Oct. 4. After completing his education at Maine Wesleyan Univ., he engaged in manufacturing in St. Paul, Minn. In 1862, Aug., he was appointed lieut.col. of the 6th Minn. infantry. He served through the war, reaching the rank of brevet brig.gen., and returned to St. Paul. A republican in politics, he was elected to congress 1871, and re-elected for a second term.

AVERNUS, *ā-vēr'nūs*, in Gr. *Aornos*, or 'without birds,' called now Lago d'Averno: a small, nearly circular lake in Campania, Italy; between Cumæ, Puteoli, and Baiæ; about a mile and a half in circumference, occupying the crater of an extinct volcano. It is in some places as deep as 200 ft., and is almost completely shut in by steep and wooded heights. The sulphureous and mephitic vapors arising from the lake were believed in ancient times to kill the birds that flew over it; hence, according to some, its Greek appellation. Owing to its gloomy and awful aspect, it became the centre of almost all the fables of the ancients respecting the world of shades. Here was located Homer's Nekyia, or entrance to the underworld; here the Cimmerians are said to have dwelt—a people who lived in deep caverns, without ever coming into the light of day, explored metals and imparted Stygian oracles; here also were placed the grove of Hecate and the grotto of the

AVERRHOA—AVERRUNCATOR.

Cumean Sibyl. Agrippa caused the dense woods to be thinned, by which the place lost much of its wildness; and by his orders Cocceius constructed the famous tunnel through the mountain to Cumæ, a work of comparative ease, considering that the hills round about are composed of volcanic tufa. The lake was also connected in ancient times with the Gulf of Baiæ. AVERNIAN, a. *a-vēr'nī-an*, pertaining to Lake Avernus.

AVERRHO'A : see CARAMBOLA.

AVERRHOES, *a-vēr'o-ēz*, properly, Ibn Roshd; more fully, Abul-Walid Mohammed-Ibn, Ahmed-Ibn, Mohammed-Ibn-Roshd: 1149-1198 (or 1206); b. Cordova, Spain: the most famous of the Arabian philosophers. His father, chief judge and mufti, instructed him in Mohammedan jurisprudence. In theology and philosophy, he had Thophail for his teacher; in medicine, Ibn Zohr, the elder. His talents and acquirements made him successor to his father, and afterwards chief judge in the province of Mauritania. Being accused, through envy, of a departure from the orthodox doctrines of Mohammedanism, he was dismissed from office, and condemned by the ecclesiastical tribunal of Morocco to recant his heretical opinions, and do penance. After this, he returned to his native place, and lived in great poverty, until the Caliph Almansor reinstated him in his offices, on which he went back to Morocco, where he died. A. regarded Aristotle as the greatest of all philosophers. He translated and illustrated Aristotle's writings with great penetration; but the influence of the Alexandrine view laid down in the commentaries of Ammonius, Themistius, and others, is easily seen in his works, as in those of most of the Arabian philosophers. In opposition to the Arabian orthodox school, especially against Algazali, A. stood forth on the side of reason as the defender of philosophy. The Arabians called him, by way of eminence, the Expositor (of Aristotle). Most of his writings are known to us only through Latin translations (Ven. 1489). The Arabic text of A.'s philosophical works was published, Munich, 1859, by M. J. Müller, whose German translation of the same appeared 1875. His Commentaries on Aristotle appeared in an edition of that philosopher's works (11 vols. Ven. 1560). He wrote also a sort of medical system, which, under the name of *Colliget*, was translated into Latin, and repeatedly printed. The philosophy of A. attained to importance in the Christian Church as early as the 13th c., although his pantheistic doctrine of the unity of the active principle in the universe was often repudiated as an error, and astrology was characterized as Averrhoism. See Renan's *Averroës et l'Averroïsme*.

AVERROIST, *a-vēr'rō-īst*: one of a sect deriving their name from Averrhoes; a branch of the Aristotelians, somewhat numerous in the 15th c. They held that all men have one common soul—a doctrine akin to pantheism.

AVERRUNCATOR, n. *āv-ēr-rūng-kā'tor* [Eng. ob. v. *averruncate*, to root up—from L. *averrunco*, to avert]: an

AVERSA—AVEYRON.

instrument for pruning trees, consisting of two blades fixed at the end of a rod, made to operate like a pair of shears.

AVERSA, *â-věr sâ*: town of s. Italy, province of Caserta; between Naples and Capua, 9½ m. s. of the latter, in a beautiful district rich in oranges and wine. It is well built; has a cathedral and a number of monasteries, in one of which, Andrew of Hungary, the Darnley of Neapolitan history, was murdered with the connivance of his wife, the beautiful but guilty Joanna, Queen of Naples; an excellent asylum for the insane, established by Murat; and a foundling hospital. A. was built, 1029, by the Normans on a territory ceded to them by Duke Sergius of Naples, to be held in fief. About 2 m. from A. are still a few ruins of the Oscan city of Atella, famous as the birth-place of the satirical farces so popular on the Roman stage. Pop. 20,000.

AVERSANT, a. *a-věrs'ant* [L. *aversans*, imp. of *aversar*, to turn one's self away]: in *her.*, turned away; a term applied to a hand, of which only the back is visible. It is also called *dorsed*.

AVERSE, a. *ă-věrs'* [L. *aver'to*, I turn away from; *aver'sus*, turned away from—from *a*, from; *verto*, I turn; *versus*, turned—*lit.*, turned away from]: disinclined to; unfavorable to; unwilling. **AVERSE'LY**, ad. *-lĭ*. **AVERSE'NESS**, n. the quality of being averse; unwillingness. **AVERSION**, n. *ă-věr shŭn*, dislike to; hatred; repugnance of mind. **AVERT**, v. *ă-věrt'*, to turn aside or away from; to turn aside; to take or keep off; to prevent. **AVERT'ING**, imp. **AVERT'ED**, pp. **AVERT'ER**, n. one who.—**SYN.** of 'averse': reluctant; adverse; unwilling; disliking; indisposed; backward; loath;—of 'aversion': disgust; hatred; reluctance; repugnance; antipathy; dislike; distaste; disinclination; enmity; ill-will; rancor; malice; malevolence.

AVES, n. plu. *ă'věz* [L. *avis*, a bird]: the class of birds. **AVIAN**, a. *ă'vĭ-ăn*, pertaining to birds (q. v.). **AVIARY**, n. *ă'vĭ-ěr-ĭ* [L. *aviārium*, a place for keeping birds]: a bird-cage; a place where birds are kept. **AVIC**, a. *ă'vĭk*, denoting an acid obtained from guano.

AVEYRON, *ă-vă'rôn*: river in the s. of France. The river rises near Severac-le-Château; flows, for the most part westerly, through the department of A.; and, after a course of 90 m., falls into the Tarn—a feeder of the Garonne—below Montauban; touching in its course the towns of Rhodéz, Villefranche, and Negrepelisse.

AVEYRON: dept. in the s. of France; 3,370 sq. m.; one of the most mountainous parts of France. Situated between the high-lands of Auvergne and the Cevennes, it slopes like a terrace s.w. to the Garonne, to the basin of which the dept. belongs. The principal rivers flow through the department from e. to w.; and between these, several ramified offsets from the chain of the Cevennes traverse the country. The climate is healthful, but cold and raw, especially in the n. and e. North of the Lot, only rye and oats are grown; in the rest of the valleys, other kinds of grain thrive, also fruit, chestnuts, potatoes, and truffles.

AVEZZANO—AVICENNIA.

A third part of the land is unfit for cultivation, but affords excellent pasture for the numerous herds of cattle, goats, and sheep, which, with the breeding of swine, form the principal resources of the mountaineers. 18,000 cwt. of cheese is sold yearly under the name of Roquefort cheese. The mineral wealth of the dept. is considerable. Coal, iron, lead, zinc, copper, vitriol, alum, and antimony are abundant; the mining, preparing, and sale of which are the principal support for the inhabitants. Besides these, the principal employments are paper-making, cotton-spinning, tanning, the manufacture of woolen cloth and carpets, etc. The seat of the departmental courts is Rhodéz, which is also a bishop's see. Pop. (1901) 382,074.

AVEZZANO, *â-vět-sâ'no*: town of s. Italy, province of Aquila, 22 m. s. from Aquila. The town belongs to the Barberini family. Pop. 6,200.

AVIARY: see AVES.

AVICENNA, *av-î-sĕn'a*: properly, Ibn Sina; more fully, Abu Ali Al-Hossein Ibn Abdallah Ibn Sina: 980-1037; b. at Charmatain, a village near Bokhara: famous Arabian philosopher and physician, whose authority for many centuries passed for indisputable. He studied with special fondness mathematics, astronomy, philosophy, and medicine. He was physician to several of the Samanide and Dilemite sovereigns, and for some time vizir in Hamadan, but afterwards retired to Ispahan, and died during a journey of the Emir Ala-ed-Daula to Hamadan. He left a multitude of writings, among which his system of medicine, *Kanun fi 'l-Tibb*, acquired the greatest reputation. It is distinguished less by originality than by intelligible arrangement of judicious selections from the writings of the Greek physicians, at a time when the knowledge of Greek was not widely spread. A. himself knew the Greek writers only through Arabic translations. The Arabic text of the *Kanun*, and of several of his philosophical writings, among which those on metaphysics especially attracted the attention of the schoolmen, appeared at Rome 1593, 2 vols. The *Kanun* was translated into Latin by Gerardus Cremonensis, and repeatedly printed (Ven. 1595, 2 vols.). His philosophical writings have also appeared several times in Latin translations (Ven. 1490, 1523, 1564).

AVICENNIA, *äv-î-sĕn'nĭ-a*: genus of plants, named from the Arabian physician, Avicenna; nat. ord. *Avicenneæ* or *Myoporaceæ*, an order very nearly allied to *Verbena-cææ* (q.v.), and almost exclusively confined to the s. hemisphere. The genus A. consists of trees or large shrubs resembling mangroves, and, like them, growing in salt-swamps. Their creeping roots, often curving for the space of six ft. above the mud before they stick into it, and the naked asparagus-like suckers which they throw up, have a singular appearance. *A. tomentosa*, the White Mangrove of Brazil, has cordate ovate leaves, downy beneath. Its bark is much used for tanning. A green resinous substance exuding from *A. resinifera* is eaten by the New Zealanders.

AVICULA—AVIGNON.

AVICULA, n. *ă-vĭk' ŭ-la* [L. *avĭc'ula*, a little bird]: genus of inequivalve oblique shells, with two species, also 300 fossil; type of *Aviculidæ*. which includes 'pearl-oysters.' **AVICULARIUM**, n. *ă-vĭk' ŭ-lă' rĭ-ŭm*, a curious appendage, frequently shaped like the head of a bird, found in many of the Polyzoa. **AVICULOPECTEN**, n. *ă-vĭk' ŭ-lô-pĕk' tĕn* [L. *pecten*, a comb]: an extensive genus of fossil bivalves. See PEARL OYSTER.

AVID, a. *ăv'ĭd*, or **AVIDIOUS**, a. *a-vĭd'ĭ-ŭs* [L. *avĭdus*, greedy]: eager; greedy. **AVIDIOUSLY**, ad. *-lĭ*, greedily; covetously. **AVIDITY**, n. *ă-vĭd'ĭ-tĭ* [L. *avid'itas*, vehement desire: F. *avidité*]: eagerness; greediness; intense desire; in *chem.*, a disposition to combine with another element.

AVIFAUNA, n. *ăv'ĭ-fawn'ă* [L. *avis*, a bird; *Faunus*, a god of the fields or woods]: all the birds peculiar to a country or area.

AVIGLIANO, *ă-vĕl-yă'nô*: town of s. Italy, province of Potenza, 10 m. n.w. of Potenza. Pop. 13,000.

AVIGNON, *ă-vĕn-yôn'* (*Avenia Cavarum*): city of Provence, in the s. of France; cap. of the dept. Vaucluse; on the left bank of the Rhone, here crossed by a long bridge. The streets are narrow and crooked. There is a multitude of churches and religious establishments, among which the cathedral on the Rocher des Dons and the church of the Franciscans, as well as the old papal palace and the tower Glacière, are distinguished. The Dominican convent now serves as a cannon-foundry. The city is the see of an abp., has a museum and picture-gallery, and other valuable institutions. The university, founded 1303, was abolished 1794. A. has manufactures of silk, silk-dyeing, tanning, iron-founding, etc., and is famous for its garden produce, fruit, wine, honey, etc. The country about A. is delightful, and extremely fruitful in corn, wine, olives, oranges, and lemons.—In A., Petrarch spent several years; it was here he saw Laura, whose monument is in the Franciscan church. Vaucluse, which he has immortalized, is about three leagues from Avignon. A. was the cap. of the ancient Cavares, and presents many remains of the times of the Romans. In the middle ages, it formed, with the surrounding district, a county, which the popes, who had already received the county of Venaissin as a gift from King Philip III., bought in 1348 from Joanna, Queen of Naples and Countess of Provence. The pope governed both counties through a vice-legatē, and continued in the possession of them till 1790, when, after several stormy and bloody scenes, the city with its district was united with France. At the peace of Tolentino (1797), the pope formally resigned A. and Venaissin. A. is celebrated in ecclesiastical history as being, for a time, the residence of the popes. By order of Philip IV. of France, Pope Clement V. and six of his successors 1309–77, were obliged to reside there. It was afterwards the residence of more than one anti-pope. Two ecclesiastical councils were held at A. (1326 and '37): the first took into considera-

AVIGNON-BERRY—AVILES.

tion the relation of the clergy to the laity; the other, the bad training of the clergy. Pop. (1901) 46,896.

AVIGNON-BERRY, n.: the berries of the *Rhamnus infectorius*, *saxatilis*, and *amygdalinus*. They are used for dyeing yellow. When they are ripe the juice is mixed with alum, to make the sap-green of the painters.

AVILA, á've-lá: town of Spain, cap. of the province of A., in Old Castile; 53 m. n.w. of Madrid. The Spaniards declare that its original name was Abula, and please themselves and amuse strangers with the belief that it was built by Hercules B.C. 1660. It is the birthplace of two highly remarkable persons—one, the learned Alfonso Tostado de Madrigal (d. 1455), whose doctrines (according to his biographer) were so enlightened that they caused the blind to see, though in the opinion of Don Quixote, he was more voluminous than luminous: the other, 'Our Seraphic Mother, the Holy Teresa, Spouse of Jesus,' b. 1515, March 28; she was made the lady-patroness of Spain by Philip III., and shares the honors of worship with St. James. A. is the see of a bp., with a beautiful cathedral, and was formerly one of the richest and most flourishing cities of Spain. The univ., founded 1482, enlarged 1638, was abolished 1807. It was at A. that the nobles of Old Castile assembled, 1465, to depose King Henry IV., and raise his brother Alfonso to the throne of Leon and Castile. At A., also, was the meeting of the so-called Third Estate, or of the Holy League, 1520, under the leadership of Juan Padilla, to which nearly all the cities of Castile sent representatives. Pop. of A. 9,000.

The province of A. has 2,981 sq. m.; pop. (1900) 200,457.

AVILA, GIL GONZALEZ DE: 1559-1658; b. Avila, Old Castile; a Jesuit and canon of Salamanca; royal historiographer for Castile and the Indies. He composed a great number of historical works, of which the following may be mentioned as containing many valuable facts: *Historia de la Vida y Hechos del Rey Don Henrique III. de Castilla* (Madr. 1638); *Historia de la Vida y Hechos del Monarca D. Filipe III.* (in Mendoza's *Monarquía de España*, 3 vols. Madr. 1770); *Historia de Salamanca* (Salam. 1606); and the *Teatro Ecclesiastico de la primitiva Iglesia de las Indias Occidentales* (2 vols. Madr. 1649-56).

AVILA Y ZUNIGA, á've-lá ē thôn'yē-gá, Don LUIZ DE: 16th c. Spanish general, diplomatist, and historian; born at Placencia, in Estremadura; enjoyed the favor and confidence of Charles V., who intrusted him with embassies to the popes Paul IV. and Pius IV., and made him grand master of the order of Alcantara. He accompanied the emperor on his expeditions to Africa, 1535, and against the princes of the league of Schmalkald, and wrote an account of the war which goes under that name, partial, indeed, but able and spirited. The *Commentarios de la Guerra de Alemanna hecha por Carlos V. en 1546 y 1547*, have been published repeatedly (first, Ven. 1548), and translated into several languages.

AVILES, ā've-lēs (anc. *Flavignavia*): town of Asturias,

AVISE—AVOCATION.

Spain, province of Oviedo; 19 m. from Oviedo. There are coal and copper mines in the vicinity. Manufactures of earthenware, glass, linen, etc., are carried on. A. was one of the cradles of the Spanish monarchy, and contains a number of curious old buildings. Pop. 8,400.

AVISE, or AVIZE, v. *ă-vîz'* [F. *avis*, an opinion: It. *viso*: OF. *vis*, way of seeing a thing, opinion—from L. *visus*, seen]: in *OE.*, to consider; to advise; to counsel: N. advice; intelligence.



Badge of Order of Aviz.

AVIZ, *ă-vîs'*: order of knighthood in Portugal, instituted by Sancho, first king of Portugal, in imitation of the order of Calatrava, and having, like it, for its object the subjection of the Moors. By the present usage, the king of Portugal wears decorations of the first three orders of Portugal—those of Christ, St. James, and Aviz united in one medal divided into three equal spaces: he is grand master of all the orders.

AVIZANDUM, n. or AVISANDUM, n. *ăv'î-zăn'dŭm* [mid. L. *advisārē*: It. *avvisare*, to pay attention, to look at: L. *ad*, and *vīsum*, to see]: in *Scots law*, consideration, as in the phrase 'to take to *avizandum*,'—that is, 'the judge will take the matter into consideration' after hearing parties, or without hearing them, of consent; used also in England in the phrase 'C.A.V.,'—that is, 'Curia avizare vult,' 'the court will consider.'

AVOCA, *ă-vŏ'ka*, or OVOCA, *o-vŏ'ka* [Celt. meeting of the waters]: small river in the s.e. of Wicklow county, formed by the union of two streams, rising in the hills of the centre of the county. The A. runs through a very picturesque vale only a quarter of a mile broad, with wooded banks 300–500 ft. high, and, after a course of nine miles, reaches the sea at Arklow. A. Vale is celebrated in Moore's *Irish Melodies*.

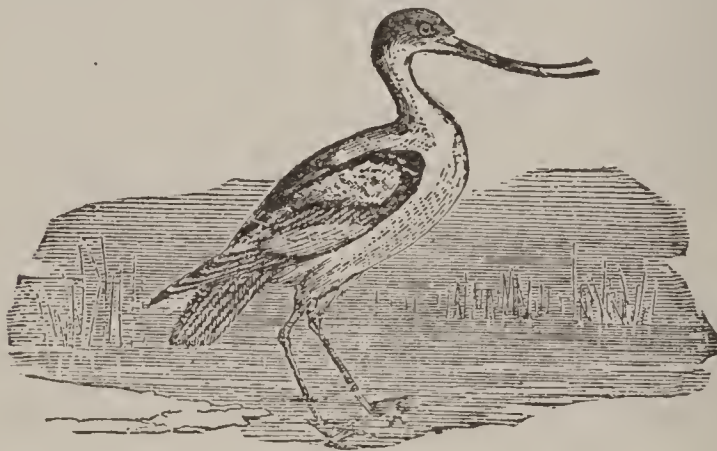
AVOCADO, n. *ăv'ŏ-kă'dŏ* [Sp.: F. *avocatier*], or ALLIGATOR PEAR (*Persea gratissima*): fruit-tree, nat. ord. *Lauraceæ* (q.v.); native of the warm regions of America. It attains the height of 30–70 ft., and is slender with a dome-like top. The leaves resemble those of the laurel. The flowers are small, produced towards the extremities of the branches. The fruit is a drupe, but in size and shape resembles a large pear; is usually of a brown color, and has a soft green or yellowish pulp, not very sweet, but of a delicate flavor, which dissolves like butter on the tongue, and is believed to consist principally of a fixed oil. It is called *vegetable butter* in some of the French colonies. It is much esteemed in the West Indies, and often eaten with sugar and lime-juice or wine, or with spices.

AVOCATION, n. *ăv'ŏ-kă'shŭn* [L. *avocātiōnem*, a calling off from any occupation—from *a*, from; *vŏco*, I call]: a

AVOCET—AVOID.

calling off from, e.g., from one's occupation or business. A. is frequently though improperly used for business, occupation, vocation.

AVOCET, or AVOSET, n. *äv'ō-sět* [F. *avocette*], (*Recurvirostra*): genus of birds, which, though having the feet webbed nearly to the end of the toes, is usually ranked among the *Grallæ* or *Grallatores*, on account of the length of the legs, the half-naked thighs, the long, slender, elastic bill, and the general agreement in habits with snipes. They are distinguished from all other birds, except a few species of humming-bird, by the strong upward curvature of the bill, which is much like a thin piece of elastic whalebone, and most probably a delicate organ of touch, adapted for seeking food in mud, as their webbed feet are for walking upon it, and their long legs for wading in the fens and marshes which they frequent. They are birds of powerful wing, not much addicted to



Avocet (*Recurvirostra avocetta*).

swimming. They scoop through the mud with the bill, first to one side, and then to the other, in quest of worms and other small animals; though Audubon has also observed the American A. taking insects which were swimming on the surface of the water, and expertly catching them in the air, running after them with partially expanded wings.—The Common A. (*R. avocetta*), the body of which is about as large as that of a lapwing, is sometimes, though very rarely, found in the fenny districts of England; it is a native also of the continents of Europe, Asia, and Africa, occurring even at the Cape of Good Hope.—Other species are natives of N. America, India, and New Holland.—The American A. (*R. Americana*) has the bill less recurved than the Common A.

AVOGADRO, *äv ö gád'rō*: the name of an Italian physicist, in the early part of the present century.

AVOGADRO'S LAW: see ATOMIC THEORY.

AVOID, v. *ä-vöyd'* [OF. *vuide*, empty; *vuidier*, or *voidier*, to empty: L. *a*, from; *vito*, I shun: perhaps L. *a*, for *ex*, out; *viduus*, empty]: to keep at a distance from; to get out of the way of; to shun; to evacuate; to become vacant. AVOIDABLE, a. *ä-vöyd'ä-bl*, that can be kept from or shunned. AVOID'ANCE, n. *-äns*, the act of becoming

AVOIRA—AVON.

vacant by death or otherwise; the act of making vacant: in Eng. ecclesiastical law, opposed to *plenarty* or fulness. See **BENEFICE**. **AVOID'ING**, imp. **AVOID'ED**, pp. **AVOID'ER**, n. one who. **AVOID'LESS**, ad. *-lēs*, incapable of being avoided; inevitable.—**SYN.** of 'avoid': to escape; elude· defeat or evade; shun; eschew; annul.

AVOIRA, n. *a-voy'ra*, or **AAVORRA**, *a'a-vōr'a* [a native S. American name]: the name given in parts of S America to palms of the genus *Astrocaryum*.

AVOIRDUPOIS, n. or a. *āv-ēr'dū-poyz'* [F. *avoir*, to have; *du*, of the; *poids*; OF. *pois*, weight—*lit.*, goods that sell by weight]: the weight of 16 oz. to the pound, employed in selling goods by weight, usually all except the precious metals and precious stones. (The word is generally said to be derived from the French *avoir du pois*, to have weight; but the middle-age Latin word *averia* or *avera*, used for goods in general, or the middle-age Latin *averare*, and French *avérer*, meaning to *verify*, are, by some, thought to offer more probable etymologies.)

The grain is the foundation of the Avoirdupois system, as well as of the Troy. A cubic inch of water weighs 252·458 grains. Of the grains so determined, 7,000 make a pound A., and 5,760 a pound Troy. See **WEIGHTS AND MEASURES**.—The A. pound is divided into 16 ounces, and the ounce into 16 drams. A dram, therefore, contains $27\frac{1}{2}$ grains, and an ounce $437\frac{1}{2}$ grains.

TABLE OF AVOIRDUPOIS WEIGHT.

27 $\frac{1}{2}$ grains	are 1 dram,	1 dr.
16 drams or drachms	“ 1 ounce,	1 oz.
16 ounces	“ 1 pound,	1 lb.
28 pounds	“ 1 quarter,	1 qr.
4 quarters	“ 1 hundredweight,	1 cwt.
20 hundredweight	“ 1 ton,	1 ton.

The above table is according to usage in the United States; though in many transactions it is understood that the cwt. contains only 100 lbs., and the ton 2,000 lbs.

A cubic ft. of water weighs 997·14 ounces A., or nearly 1,000 ounces, which gives an easy rule for determining the weight of a cubic ft. of any substance from its specific gravity.

AVON, *ā'von*: a word of British or Celtic origin, meaning 'river' or 'stream,' which seems allied to Aa (q.v.), the name of so many continental rivers. It is the name of several of the smaller British rivers, among which are: 1. The Upper or Warwickshire A., which rises in n.w. Northamptonshire, runs s.w. through Warwickshire and Worcestershire, passing Rugby, Warwick, Stratford, and Evesham, and joining the Severn at Tewkesbury. It has a course of 100 m., and receives several tributaries. 2. The Lower, or Bristol, or West A., which rises in n.w. Wiltshire, and runs 70 or 80 m., first s. in Wiltshire, and then w. and n.w. between Gloucestershire and Somersetshire. It traverses an oolitic basin, and runs generally between deep banks in a rich valley, passing Bradford, Bath, and Bristol, and empties into the Bristol Channel. It is

AVOUCH—AVULSED.

navigable for large vessels up to Bristol. A canal through the middle of Wiltshire connects it with the Thames. 3. The Wiltshire and Hampshire, or East A., which rises in the middle of Wiltshire, and runs south 70 m. through Wiltshire and Hampshire, passing Amesbury, Salisbury, and Ringwood, and entering the English Channel at Christchurch. It is navigable up to Salisbury. It abounds in the small delicate loach. In Wales two rivers named A.—one rising in Monmouthshire, the other in Glamorganshire—fall into Swansea Bay. In Scotland there are several of the same name, affluents of the Spey, Annan, Clyde, and Forth.

AVOUCH, v. *ă-vōwch'* [Norm. F. *advoucher*—from L. *ad*: OF. *voucher*, to vouch, to justify: F. *avouer*, to avow—applied to the admission by a tenant of a certain person as his feudal superior; called in mid. L. *advōārē*—from L. *advocārē*]: to maintain or defend the rights of another; to affirm; to assert; to affirm in favor of. AVOUCH'ING, imp. AVOUCED, pp. *ă-vowcht'*. AVOUCH'ER, n. one who. AVOUCHABLE, a. *-a-bl*, that may be avouched. AVOUCH'MENT, n. *-mēnt*, the act of avouching; the state of being avouched; that which is avouched.

AVOW, v. *ă-vōw'* [OF. *avoer*: F. *avouer*, to avow, to confess—see above]: to declare openly with a view to justify; to affirm resolutely or boldly; to own or confess. AVOW'ING, imp. AVOWED, pp. *ă-vowd'*: ADJ. declared, without disguise. AVOWEDLY, ad. *ă-vow'ēd-lī*, in an open, undisguised manner. AVOW'ER, n. one who. AVOWABLE, a. *ă-vow'ā-bl*, that may be openly acknowledged. AVOWABLY, ad. *-blī*, in a way that can be avowed. AVOW'AL, n. an open confession or declaration.—SYN. of 'avow': to own; recognize; acknowledge; confess.

AVOWANT, n. *a-vow'ant*, in Law: 'a person making cognizance,' or admitting that he distrained certain goods belonging to another, but maintaining that he was justified in doing so.

AVOWEE, n. *a vow'ē* [F. *avoué*, formerly, the protector of a church or religious community; now, a lawyer]: an acknowledged friend: in *Eng. law*, a person to whom the advowson of a church belongs.

AVOWRY, n. *a-vow'rī* [OF. *avouerie*—from L.L. *advocaria*]: a term used when, on a person suing replevin of goods, which he alleges that the defendant distrained, the latter, in reply, avows or openly declares that he did take the goods, but adds that he had proper justification of the deed, as that the distraint was for rent due, for damage done to his property, or for some similar cause.

AVRANCHES, *ă-vrónsh'* (anc. *Abrancæ*): city of the dept. of Manche, France, near the left bank of the Seez, 33 m. s.s.w. from St. Lo; on the sides and summit of a high hill. It has manufactures of lace, tiles, and bricks, and a little trade in grain, butter, cattle, etc. Pop. 7,800.

AVULSED, a. *ă-vūlst'* [L. *avul'sus*, torn or pulled away—from *a*, from; *vu'sus*, plucked or pulled]: plucked or

AVUNCULAR—AWE.

pulled off. **AVULSION**, n. *ā-vŭl'shŭn* [F.—L.]: a pulling or tearing asunder one thing from another.

AVUNCULAR, a. *a-vungh'u-lār* [L. *avunculus*, a maternal uncle—from *avus*, a grandfather; Eng. suffix, *-al*]: pertaining to an uncle.

AWAIT, v. *ă-wāt'* [*a* for L. *ad*: OF. *waiter*: F. *guetter*, to watch: *a*, and *wait* (see **WAIT**)]: to look for; to be ready for; to expect; to be in store for: N. in *OE.*, ambush; watch: V. to attend upon; to watch. **AWAIT'ING**, imp. **AWAIT'ED**, pp.

AWAKE, v. *ă-wāk'* [AS. *awacnian* or *awacan*, to awake (see **WAKE**)]: to rouse from sleep; to infuse new life into: **ADJ.** not sleeping; in a state of vigilance. **AWAK'ING**, imp. **AWAKED**, pp. *ă-wāk't'*. **AWOKE**, pt. *ă-wōk'* [AS. *awoc*, and *awacode*, awoke]: roused from sleep. **AWAKEN**, v. *ă-wāk'n*, same meaning as *awake*. **AWAKENING**, imp. *ă-wāk'nĭng*: N. the act of arising from sleep, lethargy, or death, or of being excited to action; the state of being aroused from any of these; *familiarly*, a revival of religion. **AWAKENED**, pp. *ă-wāk'nd*. **AWAKENER**, n. *ă-wā'kn-ēr*, one who. **AWAKENINGLY**, adv. *a-wāk'nĭng lĭ*, in a manner to waken. **TO BE WIDE AWAKE**, silently but carefully on the watch; quite aware of what is being done.—**SYN.** of 'awake, v.': to excite; rouse or arouse; incite; stimulate.

AWANTING, imp. or a. *ă-wawnt'ĭng* [AS. *a*, intensive; and *wantĭng*]: denoting absence; missing; wanting.

AWARD, v. *ă-wawrd'* [prov. F. *eswarder*, to inspect goods: It. *guardare*: F. *regarder*: OH. Ger. *warten*, to look at—*lit.*, to look at for forming a judgment]: to assign to by sentence; to adjudge; to determine: N. a sentence; the decision of arbitrators. **AWARD'ING**, imp. **AWARD'ED**, pp. **AWARD'ER**, n. one who.

AWARE, a. *ă-wār'* [AS. *gewaere*: Ger. *gewahr*, aware: OH. Ger. *gawar*]: informed of; foreseeing; vigilant; on one's guard.

AWAY, ad. *ă-wā'* [AS. *aweg*: prov. Ger. *erweg*: Ger. *weg*, way, and *weg*, away]: at a distance; absent; in a state of absence; signifying in phrases, moving or going from: **INT.** begone! let us go! **AWAY WITH**, take away. **TO MAKE AWAY WITH**, to kill; to destroy. **AWAY-GOING**, applied to the last crop a tenant has to cut down; designating a tenant about the end of his lease, and leaving his holding or farm. **I CANNOT AWAY WITH**, I cannot endure or tolerate.

AWE, **LOCH**: lake in the centre of Argyleshire, 108 ft. above the sea; extending n.e. and s.w. about 24 m., with an average breadth of from half a mile to $2\frac{1}{2}$ m. The country around consists of mica slate. The scenery is most striking at the n.e. end of the lake, where the water is studded with numerous wooded islets, overshadowed by towering and rugged mountains, prominent among which rises the dark and rocky ridge of Ben Cruachan, 3,669 ft. high, and 14 m. in circuit. Of the islands, the most noted is Fraoch-eilean, containing the remains of a castle granted to Gilbert M'Naughton, 1267, by Alexander III. On a pen-

AWE—AWKWARD.

insula, in the n. end of the lake, stands Kilchurn Castle (Caesteal Chaoil-chuirn), once a fortress of great strength, built about 1440 by Sir Colin Campbell of Glenorchy, and garrisoned, as late as 1745, by the king's troops. The waters of the lake (which seldom freezes) are carried off at its n.w. end by the river Awe, which, after a course of 7 m., enters the sea at Bunawe on Loch Etive. The magnificent 'Pass of Awe,' through which the road runs beneath the shoulder of Ben Cruachan, was the scene of a conflict, 1308, between Robert the Bruce and the M'Dougalls of Lorn, in which that clan was almost exterminated. At the n.e. end of the loch, it receives the waters of the Orchy and Strae. Loch A. contains fine fish, especially trout, *Salmo ferox*, and salmon; and the small villages of Claddich and Port Sonachan are a resort of anglers. The n. end of the loch is skirted by the railway from Callander to Oban.

AWE, n. *aw* [AS. *ege*: Dan. *ave*, correction, fear: Icel. *ægir*, terrible]: fear mingled with reverence; solemn dread; reverential fear: V. to influence by fear; to strike with reverence. **AW'ING**, imp. **AWED**, pp. *awd*. **AWE'LESS**, a. **AWESOME**, a. *aw'sūm*, appalling; causing terror; expressive of fear or reverence. **AWE'STRUCK**, impressed or struck with awe. **AWFUL**, a. *āw'fool*, that inspires or strikes with awe; terrible; dreadful; in *OE.*, in authority; worthy of respect. **AW'FULLY**, ad. *-lŷ*. **AW'FULNESS**, n. the quality of striking with awe; solemnity. **AWFUL-EYED**, a. having eyes fitted to inspire awe.—**SYN.** of 'awe, n.': fear; dread; reverence; veneration;—of 'awful': dreadful; fearful; frightful; terrible; terrific; tremendous; horrid; horrible; formidable; direful.

AWEARY, a. *ā-wēr'ī* [AS. *a*, and *weary*]: weary; tired.

A-WEATHER, ad. *ā-wēth'ēr* [*a*, to, and *weather*]: a sea-term denoting 'on the side exposed to the weather,' or that on which the wind blows, as opposed to *a-lee*, on the side sheltered from the wind: a helm is said to be A. when pressed close to the weather side of the ship.

AWEIGH, ad. *ā-wā'* [*a*, and *weigh*]: a sea-term, applied to the position of an anchor when just loosened from the ground, and hanging vertically in the water; nearly equivalent to *a-trip*.

AWHAPE, v. *ā-hwāp'* [W. *chwaff*, a gust: Icel. *kefia*, to suffocate: Sw. *quaf*, choking]: in *OE.*, to take away the breath with astonishment; to dismay; to terrify.

AWHILE, ad. *ā-hwīl'* [*a*, and *while*]: for a short time.

AWHIT, n. or ad. *ā-hwīt'* [AS. *a*, on, and *whit*]: a whit; a jot; a tittle.

AWKEND, n. *awk'ēnd* [etymology doubtful. Dut. *ave-rechts* (?) wrong, backwards; or AS. *aweg* (?) away, out; or O. Icel. *af*, (?) off]: the butt-end of a rod or wand.

AWKWARD, a. *awk'wērd* [AS. *awroh*, awry: Icel. *af-gata*, a side-way: Sw. *afwig*, inside out]: left-handed; unskilful; clumsy; bungling; difficult; unable to use hands or tools easily; in *OE.*, unfortunate; untoward; adverse.

AWL—AX.

AWK'WARDLY, ad. -lŷ. **AWK'WARDNESS**, n. the state of being awkward; clumsiness.—**SYN.** of 'awkward': perverse; indirect; left-handed; unskilful; clumsy; ungainly; uncouth; ungraceful; inelegant; unpolite; bungling; unready; unfavorable; adverse.

AWL, n. *awl* [AS. *æl*: Ger. *ahle*: Icel. *alr*]: a shoemaker's tool for boring holes. **AWL'SHAPED**, a.

AWLWORT, n. *awl'wert* [*awl*, from the shape of the leaves; and *wort*]: a stemless aquatic plant extending its leaves two or three feet under water; the *Subulārīā aquatīca*, ord. *Crucif'eræ*. Native of lakes, Me., N. H., and Europe.

AWME, or **AUME**, n. *awm* [Ger. *aum*]: a German measure of capacity for liquids, especially for the Rhenish wines, containing 41 English wine-gallons.

AWN, *awn* n. [Icel. *ögn*: Sw. *agn*: Gr. *achnē*, chaff]: a scale or husk of anything; the beard of corn or grass; the bristle-like elongation of the mid-rib of a bract. **AWN'LESS**, a. **AWNY**, a. *awn'ī*, pertaining to. **AWNED**, a. *awnd*, furnished with awns.

AWN (*Arista*): in the flowers of Grasses, a solitary pointed bristle, growing either from a glume or a palea. The flowers of some grasses are entirely *awnless*; in many, the glumes alone are *awned* (or *aristate*), or only one of them; in others, the glumes are awnless, and the paleæ, or one palea, awned. The awn is often terminal, and appears as a prolongation of the midrib of the glume or palea; from which, however, it sometimes separates below the point, and is then said to be on the back of it, or *dorsal*; sometimes it is jointed at the base, and finally separates at the joint; sometimes it is knee-bent or geniculate; sometimes it is twisted and liable to twist and untwist hygrometrically; sometimes it is rough, or even serrate, at the edges, as in barley; sometimes it is feathery, as in feather-grass (*Stipa*), which is remarkable for the great length of its awn. The characters of genera and species are often derived from it, but it is not invariable, even in the same species, and the cultivated varieties of wheat and oats differ much in being more or less *bearded*. There appears to be a tendency to the diminution or disappearance of the awn through cultivation.

AWNING, n. *awn'ing* [Pers. *awang*, something hung, hence probably OF. *auvent*: mid. L. *auvanna*, a pent house of cloth before a shop-window]: a cover spread above the deck of a vessel, or any open place, to afford a shade.

AWRY, a. or ad. *ă-rī'* [AS. *a*, on, and Eng. *writhe*, to twist—*lit.*, on the twist (see **WRITHE** and **WRY**)]: asquint; obliquely; not in a straight line; uneven; crooked; aside from the straight line of truth; perversely.

AWS, or **AWES**, n. *awz* [Old Sw. and Ger. *ach*, water]: the buckets or projections on the rim of a mill-wheel designed to receive the shock of the falling water.

AX, n. or **AXE**, *ăks* [AS. *ax*: Icel. *öxi*: Dan. *ökse*: Gr. *axīnē*, an ax]: a tool with an iron blade used for chopping. **AX'-HEAD**, n. **AX-HELVE**, n. the handle of an ax. **AX'**

AXAYACAT—AXHOLME ISLE.

SHAPED, a. AX-STONE, n. a mineral; a sub-species of jade, of a deep sea-green or leek color, used by the New Zealanders and certain South Sea Islanders in making hatchets, etc. AXINITE, n. *āk'sīn-īt*, a mineral, one of the garnet family—so called from the ax-like form of its crystals.

AXAYACAT, n. *āks' ā-a-kāt*, or AXAYACATL, *āks' ā-a-kātł* [Mexican]: a Mexican fly, the eggs of which, deposited abundantly on rushes and flags, are collected and sold as a species of *caviare*. The use of these as an article of food was learned by the Spanish settlers from their predecessors, the native Indian Mexicans, who called the dish now described *ahuauhtli*.

AXE: name of two small rivers in the s.w. of England. One rises in the Mendip Hills, n. of Somerset, runs first s.w., and then n.e., through a carboniferous limestone, trias, and diluvial basin, past Wells and Axbridge, into the Bristol Channel. The other rises in w. Dorset, and flows 21 m. s. and s.w., through e. Devonshire, in an oolitic and trias basin, past Axminster into the English Channel. A. is only another form of Exe. See AA.

AXEL, *āks'ēl*, or ABSALON, *āb'sā-lōn'*: Abp. of Lund in Denmark, and minister and general of King Waldemar I.: 1128–1201; descendant of a distinguished family. In youth studied at Paris. A. was notable for wisdom and uprightness in peace, and valor and address in war. He drove the Wendish pirates from the coasts of Denmark, and subdued them in their own settlements. He defeated the Pomeranian prince, Bogislav, and made him dependent on Denmark. In the wise legislation of Waldemar and of his son, he took a great part. He promoted learning, and to his encouragement we owe the first connected history of Denmark by Saxo Grammaticus. By building a fortified castle for defense against the pirates, he laid the foundation of the great city of Copenhagen, then an insignificant fishing village; whence the city sometimes has the name of Axelstadt. A. was buried in the church of Soroe, where he had founded a monastery. See the latest complete biography of A. by Est-rup, trans. into German by Mohnike in Illgen's *Zeitschrift für Historische Theologie* (2 vols. Leip. 1832).

AXESTONE, *aks'stōn*: a mineral generally regarded as a variety of Nephrite (q.v.). It is greenish, more or less translucent, hard, tough, and not easily broken. It occurs in primitive rocks, always massive, in Saxony, in Greenland, and in New Zealand, and other islands of the s. Pacific. It derives its name from the use to which it is put by the natives of these islands for making their hatchets. They also make ear-drops of it.

AXHOLME ISLE, *aks'hōlm īl* [A. Sax. *holme*, a river-isle]: low level tract in the n. of Nottinghamshire, surrounded by rivers—the Trent on the e.; Don. n. and w.; Torne and Idle, on the w.; and Vicardyke, between the Trent and Idle on the s. This district, 18 m. from n. to s., and 5 on an average e. and w., was anciently a forest, but afterwards became a marsh. The marsh was drained into the Trent, 1634, by Vermuyden, a Dutchman, after

AXIAL—AXIOM.

five years' labor, and at the cost of £56,000. The reclaimed land became very fertile under Dutch and French Protestant settlers, and after much litigation it was, 1691, divided, the original inhabitants receiving 10,532 acres and the settlers 2,868. On the land are raised abundant crops of wheat, oats, rye, peas, beans, clover, flax, rape, hemp, potatoes, and onions. Peat and turf fuel abound, and valuable gypsum beds occur. The water is brackish, too hard for washing, and curdles milk when boiled with it. Axholme Isle includes seven parishes. There are two small towns, Crowle and Epworth.

AXIAL, a.: see under Axis.

AXIL, n. *ăk'sîl* [L. *axil'la*, the armpit: Icel. *öxl*, the shoulder-joint: Dut. *oxel*]; the armpit; in *bot.*, the upper angle formed by the attachment of a leaf or branch to its support. Buds usually grow in the axils of leaves, though they are not always actually developed; but a bud may be made to appear in such a situation, and to form a new shoot or branch, by artificial means, which direct the strength of the plant more particularly to that quarter, as cutting over the main stem, wounding it above the place where the new branch is desired, etc. Flowers or flower-stalks (*peduncles*) growing from the axils of leaves are called *axillary*. AXILLAR, a. *ăk'sîl-lér*, or AX'ILLARY, a. *-lér-î*, pertaining to the armpit; arising from the axil in plants. AXICLE, n. *aks'î-kl* [dim. of *axil*]; a sheave.

AXIM, *ă-shēng'*, or *ăks-im'*: important station and port on the Gold Coast, a little to the e. of the mouth of the Ancobrah river. Inland from A., in the basin of that river, and in the dist. between it and the Prah, gold-mining operations have recently been carried on on a large scale. See Burton and Cameron, *To the Gold Coast for Gold* (1882).

AXINE, a. *ăks'în* [L. *axis*; Eng. *-ine*]: pertaining to a group of stags, of which *Cervus axis*, Linnæus, the Spotted Axis, is the type: N. a member of the A. group of stags. See Axis.

AXINOMANCY, n. *ăks-în'ô-măn-sî* [Gr. *axīnē*, an ax; *mantei'ă*, divination]: a mode of divination by means of an ax, much practiced by the ancient Greeks, particularly with the view of discovering the perpetrators of great crimes. An axe was poised upon a stake, and was supposed to move so as to indicate the guilty person; or the names of suspected persons being pronounced, the motion of the ax at a particular name was accepted as a sign of guilt. Another method of A. was by watching the movements of an agate placed upon a red-hot ax. See DIVINATION: DIVINING-ROD.

AXINURUS, n. *ăks-în-ūr'ûs* [Gr. *axine*, an ax; *oura*, tail]: genus of spiny-finned fishes, placed by Cuvier under his family *Theutyes*.

AXIOM, n. *ăk'sî-ûm* [Gr. *axiōma*, an established or conceded principle: F. *axiome*]: a self-evident truth; an established principle in an art or science. AXIOMATIC, a.

AXIOM—AXIS.

āk'sī-ō-māt'īk, or AX'IOMAT'ICAL, a. *-ī-kāl*, relating to an axiom. AX'IOMAT'ICALLY, ad. *-kāl-ī*.—SYN. of 'axiom': maxim; aphorism; apothegm; saying; adage; proverb; by-word; saw; truism; principle.

AXIOM, *āk'sī-ūm*: a general proposition, which the understanding recognizes as true, soon as the import of the words conveying it is apprehended. Such a proposition is therefore known directly, and does not need to be deduced from any other. Of this kind, for example, are all propositions whose predicate is a property essential to our notion of the subject. Every rational science requires such fundamental propositions, from which all the truths composing it are derived; the whole of geometry, for instance, rests on a very few axioms. Whether there is, for the whole of human knowledge, any single, absolutely first A., from which all else that is known may be deduced, is a question that has given rise to much disputation; but the fact, that human knowledge may have various starting-points, answers it in the negative. Mathematicians use the word A. to denote those propositions which they must assume as known from some other source than deductive reasoning, and employ in proving all the other truths of the science. The rigor of method requires that no more be assumed than are absolutely necessary. Every self-evident proposition, therefore, is not an A. in this sense, though, of course, it is desirable that every A. be self-evident; thus, Euclid rests the whole of geometry on fifteen assumptions, but he proves propositions that are at least as self-evident as some that he takes for granted. That 'any two sides of a triangle are greater than the third,' is as self-evident as that 'all right angles are equal to one another,' and much more so than his assumption about parallels, which, it has been remarked, is neither self-evident nor even easily made evident. See PARALLELS. Euclid's assumptions are divided into three 'postulates' or demands, and twelve 'common notions'—the term A. is of later introduction. The distinction between axioms and postulates is usually stated in this way: an A. is 'a theorem granted without demonstration,' a postulate is 'a problem granted without construction'—as, To draw a straight line between two given points.

AXIS, n. *āk'sīs*, AXES, n. plu. *āk'sēz* [L. *axis*; Gr. *axōn*; Ger. *achse*, a pole or axle-tree, a pivot: Sks. *aksha*, a wheel]: the line, real or supposed, round which anything revolves; in *bot.*, the central portion of the young plant whence the plumule and radicle are given off; the central organ which gives rise to buds; in *anat.*, the second vertebra of the neck upon which the head and first vertebra rotate, as on a pivot. AXIAL, a. *āk'sī-āl*, of or relating to an axis. AX'IALLY, ad. *-lī*. AXLE, n. *āk'sl*, or AXLE-TREE [AS. *eaxl*, the shoulder: Icel. *öxl*, the shoulder-joint; *öxull*, an axis: Dan. *axel*, an axle; and *tree*, in the primary sense of a block or piece of wood]: the wooden or iron bar round the ends of which wheels can turn. AXLED, a. *āk'sld*, furnished with axles. AXIFEROUS, a. *āks-'if-ēr-ūs* [L. *axis*; *fero*, I bear]: bearing an axis. AX'IFORM, a. of the form of an

AXIS.

AXIS. **AXIS DEER**, an Indian species of deer marked with white spots. **AXLE-BOX**, the part of a locomotive or carriage within which an axle turns, and on which the weight of the machine rests.

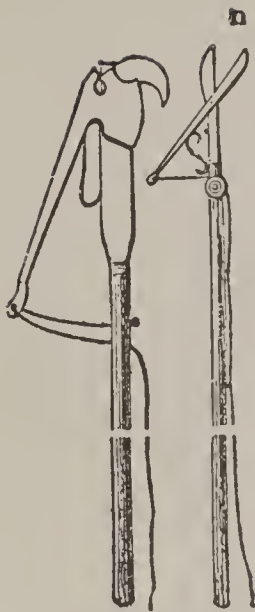
AXIS, in Botany: the central part both above and below ground, around which the whole plant is regarded as arranged. The stem is called the *ascending A.*; the root the *descending axis*. The opposite tendencies of growth appear as soon as a seed begins to germinate, in the radicle and plumule; the former of which is the descending A., and the latter the ascending A.; the former descending deeper into the soil, the latter ascending towards the air and light. That part of the stem around which the flowers are arranged is called the *floral A.*, and, in describing some kinds of inflorescence, the terms *primary floral A.*, *secondary floral A.*, etc., are occasionally employed.

AXIS, *ák'sis*, in Geometry: a central line. The A. of a curved line is formed by a right line dividing the curve into two symmetrical parts, so that the part on one side exactly corresponds with that on the other; as in the parabola, the ellipse, and the hyperbola. The A. of any geometrical solid is the right line which passes through the centre of all the corresponding parallel sections of it: in this sense, we speak of the A. of a cylinder, a globe, or a spheroid. By the A. of rotation, we understand the right line around which a body revolves.—In physical science, the A. of a *lens* is the right line passing through it in such a manner as to be perpendicular to both sides of it; and the A. of a telescope is a right line which passes through the centres of all the glasses in the tube. The A. of the *eye* is the right line passing through the centres of the pupil and the crystalline lens.

AXIS (*Cervus Axis*): species of deer, abundant on the banks of the Ganges, but found throughout India and in many islands of the Eastern Archipelago. One of its Indian names is Chittra, and by British sportsmen in India it is generally called the Spotted Hog-deer. By some naturalists, it has been made the type of a genus of *Cervidæ*, called *Axis*. The A. has a great resemblance in size and coloring to the European fallow-deer; it is generally of a rich fawn color, beautifully spotted with white, nearly black along the back, the under parts snow-white. The horns, however, differ very much from those of the fallow-deer, being slender, sharp-pointed, little branched, and not at all palmated. The female has no horns. The A. frequents thick jungles in the vicinity of water, and feeds during the night. It is commonly found in herds of 15 or 20, of which 3 or 4 are males. Its sense of smell is remarkably acute, and it is generally very shy and timid, so that sportsmen find it difficult to approach within shot. The males, however, sometimes exhibit great courage in the defense of the young. It is very easily domesticated, is very gentle in its manners, has been frequently imported into Europe, and breeds freely in the parks in which it is kept.

PLATE 1.

Averruncator
Axolotl



Two forms of
Averruncator.



Aversant or
Dorsed.



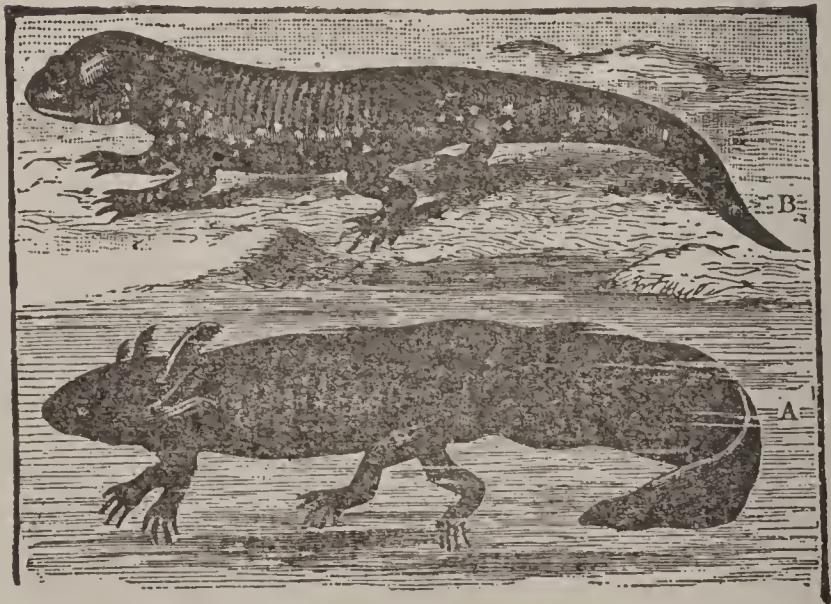
axil. Axils.



Avocado or Alligator Pear
(*Persea gratissima*).



The American Ax.



A, Axolotl ; B, Amblystoma.

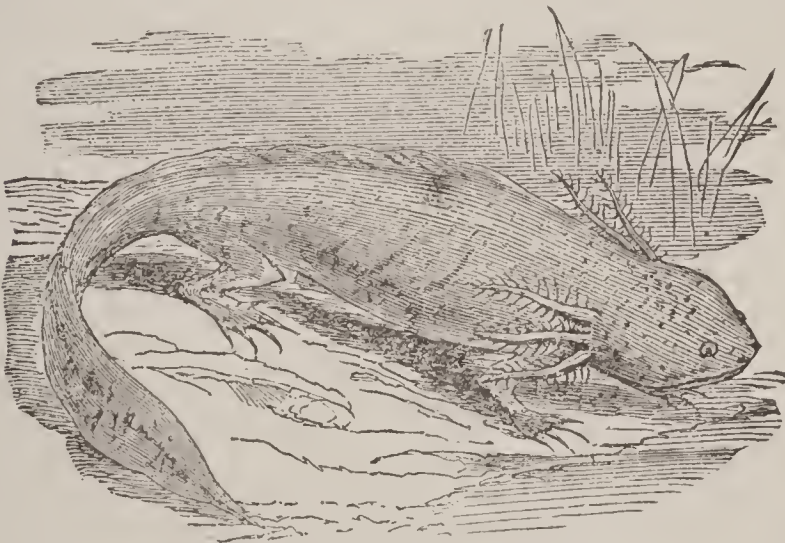
AXMINSTER—AXOLOTL.

AXMINSTER, *aks'mĭn-stēr*: small town in e. Devonshire, on the side of a little hill on the left bank of the Axe. A. formerly was famous for the manufacture of Turkey and Persian carpets, little inferior to those imported. Two celebrated geologists have been connected with A.: Dr. Buckland was born here, and Dr. Conybeare was lord of the manor and vicar. Pop. abt. 3,000.

AXMOUTH, *aks'mowth*: village at the mouth of the Axe, Devonshire. A mile e. of A. occurred, 1839, a landslip; an area 200 ft. wide, for three-quarters of a mile parallel to the shore, having sunk 250 feet below the sea, with a great noise. The chasm thus formed became a lagoon, while the neighboring sea-bed rose 40 ft. Rather more than a mile further e., occurred another but smaller landslip, 1840. The district around consists of greensand strata.

AXOIDS, n. plu. *aks'oyds* [Gr. *axōn*, an axle, a wheel; *eidos*, resemblance]: a term applied to the curves described by the surface of a cylinder and a plane, when the former rolls on the latter, producing a succession of lines or axes of rotation. **AXOIDEAN**, a. *aks-oyd'ē-ăn*, of or pertaining to axoids.

AXOLOTL, n. *aks'ō-lōt'l* [Mexican word], (*Siredon lichenoides*, Baird): remarkable amphibian animal, abundant in some Mexican lakes, particularly in the Lake of Mexico itself. It is a Batrachian (q.v.) reptile of the family of the *Proteidæ* or *Perennibranchiate Batrachians*, in which the gills remain during life, and the lungs are



Axolotl.

never sufficiently developed to maintain respiration by themselves. It is in general form very like a fish; has a large and broad head; and tapers into a long, compressed tail, which has a thin membranous fin both on its upper and its lower side. It has four legs, with toes not webbed; and on each side of the neck the gills form three long branched or feathered processes, which give it a very remarkable appearance. It is brown, and mottled with small black spots. When full grown, it averages 8 or 9 inches

AXOPHYTE—AY.

in length, though sometimes measuring 16 inches. The Mexicans esteem it a great delicacy for food. These normally perennibranchiate creatures are capable, under certain circumstances, of becoming salamandrine, losing their gills, and so turning into *Amblystomas*.

AXOPHYTE, n. *ăks'ō-fīt* [Gr. *axōn*, a pole or axle-tree; *phuton*, a plant]: in *bot.*, the united stem and root of a plant.

AXOTOMOUS, a. *ăk-sōt'ō-mūs* [Gr. *axōn*, an axis; *tōmē*, a cutting; *temno*, I cut]: applied to minerals that can be cleaved in one particular direction.

AXUM, *ăk-sōm'*: formerly cap. of an Ethiopian kingdom; now in the modern Abyssinian province of Tigre. It is mainly in ruins. Pop. 2,000.

The former greatness of the city is testified by remaining structures cut in granite, some with inscriptions. From these it appears that the Axumite empire extended over Abyssinia, and even over Yemen and Saba in Arabia, and possessed the command of the Red Sea. It acquired political importance from the fact, that it formed on the s. a boundary to the world-embracing power of Rome, as well as to that of Parthia, which then extended as far as Arabia. The Byzantine emperors even paid an annual tribute to the sovereigns of Axum. This country was also the furthest point s. that Grecian civilization reached; through the medium of Egypt, Greek philosophy spread into A., and the Greek language became the language of the court and of the priests. Under King Aizanes, who, in a remaining inscription, appears as a heathen, Christianity was introduced into the country from Egypt by the two apostles Frumentius and Ædesius, followed by many priests from the same quarter. The new doctrine soon spread over the whole country; Frumentius was made the first Bp. of A., and Fremona was built in honor of him. The stone churches, many of them very imposing, yet scattered over Abyssinia, owe their architecture to Egyptian priests, and arose at that period, as well as the most celebrated Abyssinian convents, and hermitages. The Axumite empire carried on, through Adule, an active commerce with Arabia and India; it formed the outermost bulwark of Christianity; and, as such, particularly from about the 6th c., it interfered in behalf of the Christians in Arabia, and became the natural enemy of Mohammedanism. The contests in which it soon became involved with that power caused its fall, as the kings gradually lost their possessions in Arabia, and the whole coast on the Red Sea and Gulf of Aden. The outlets for commerce were thus cut off, and the empire was at the same time so weakened by constant wars, that internal disorders brought on its complete dissolution.

AXUNGE, n. *ăk'sŭnj*, or **AXUNGEA**, *ăk-sŭn'jĭ-ă* [L. *axis*, an axle-tree; *un'gŭō*, I smear]: the hardest and firmest part of the fat of animals; hog's lard.

AY, or **AYE**, ad. *ă'ĭ*, or as pron. I [AS. *gea*; Ger. *ja*, yea, yes]: yea; yes; certainly; indeed; more than that.

AY—AYE—AYĒ.

AYES, n. plu. *ā'yz*, or *īz*, used in legislative and deliberative bodies, when counting the votes—those voting in favor of a motion are called the **AYES**, those voting against it are called the **NOES**, *nōz*. **AY**, **AY**, yes, yes; is it so? *Note*.—**Ay** is probably only a corruption of *yea*, due to confusion with the interjection *ay!* which possibly is a different word: see Skeat.

AY, int. *ī* [OF. *ay*: AS. *eá*, *ay!*]: in *OE.*, an interjection of surprise or complaint. **AY ME!** [OF. *aymi*]: ah! for me.

AYACUCHO, *ī-ā-kō'chō*: town in the dept. of A., s. Peru. Here, 1824, Dec. 9, the combined forces of Peru and Colombia—the latter then comprising Ecuador, New Granada, and Venezuela—totally defeated the last Spanish army that was ever seen on the new continent.

The dept. of A., 24,213 sq. m., is on the e. side of the ° Andes. Pop. 147,909. See **HUAMANGA**.

AYAH, n. *ā'y'yă* or *ā'yĭ* [Port. *aya*, a governess]: the name given in India to a native female nurse or waiting-maid.

AYALA, *ā-yā'lá*, **PERO LOPEZ DE**, called *El Viejo*, to distinguish him from his son of the same name: 1332–1407; b. Murcia, of one of the first families of the Castilian nobility. He stood high in the regard of several kings of Castile, and filled the first offices of the state, latterly that of high-chancellor and high-chamberlain of Castile. At the battle of Najera, 1367, he was taken prisoner by the English, then in league with Peter the Cruel, and confined for some time in an English dungeon; and again, 1385, by the Portuguese, at the battle of Aljubarota. He died at Calahorra. A. has repute, not only as a statesman, but also as a writer, especially as historian and poet. His best known work is his *Crónicas de los Reyes de Castilla D. Pedro, D. Enrique II., D. Juan I., D. Enrique III.* (2 vols. Madr. 1779–80—the older editions, 1495 and 1591, are imperfect). He was the first among the Spaniards to give up the usual simple narrative of events in the order of time, and to seek a more rational representation of them according to the rules of historic art. It is only in recent times that the poetical works of A. have been discovered; the most remarkable of which is the *Libro o' Rimado de Palacio*. This 'Book in Rhyme on Court-life,' as its singular title may be translated, was begun during the poet's first captivity in England, and is composed in the old national form of rhyming Alexandrine stanzas of four lines; the contents are satirical and didactic. A. appears in his poetical works as a representative of that transition epoch of Spanish national literature, when it was passing from a popular original literature to one of a more artificial imitative character.

AYE, ad. *ā* [AS. *ava*: L. *ævum*, an age: Icel. *ei*, ever: Gr. *aei* or *aiei*, always]: ever; to eternity.

AYE-AYE, n. *ī'ī* [native name *Hai-Hai*, from the creature's cry *hī, hī*], (*Cheiromys Madagascariensis*): a rare quadruped about the size of a hare, native of Madagascar; at first

AYERST HALL—AYESHAH.

placed by naturalists among Squirrels, and ranked by Cuvier with them in the order of Rodents (*Rodentia*), although Sonnerat, who discovered it, pointed out its affinity also to the Makis or Lemurs, to which family it is now generally referred. The principal reason for placing the A. among the *Rodents* has been found in the conformation of its teeth; but



Aye-aye.

the other characters of the animal agree generally with those of the Lemurs, and its habits resemble theirs. The A. has large broad ears, large round eyes, long brownish-gray hair, and a large bushy tail, which it does not carry over its back as squirrels do. It is very active during the night, but sleeps during the day. In confinement, it will subsist on boiled rice and fruits, but its chief natural food is a white insect. The teeth scratch away the bark of trees for insects, and the long claws serve to draw them out. The native name *Hai-Hai* is derived from the creature's cry, *hī*, *hī* (see *Nature*, xxvi).

AYERST HALL: hostel founded at Cambridge University (England), 1884, with the purpose of providing an economical education for theological and other students.

AYESHAH, *ā'e-sha* or *ī'e-sha*: the favorite wife of Mohammed, 610 (or 611)–677; b. Medina. She was only nine years of age when she married the Prophet. Her father's name was Abdullah, but he was surnamed Abu-Bekr, 'father of the virgin,' in consequence, it is said, of his daughter being the only one of Mohammed's wives who was a virgin. Although A. bore no children to Mohammed, she was so tenderly beloved by him, that he was wont to say that she would be the first of his wives to whom the gates of Paradise would be opened. It is stated by Mohammedan historians, that to the charms of her beauty she added a knowledge of mathematics, rhetoric, and music;

PLATE 2.

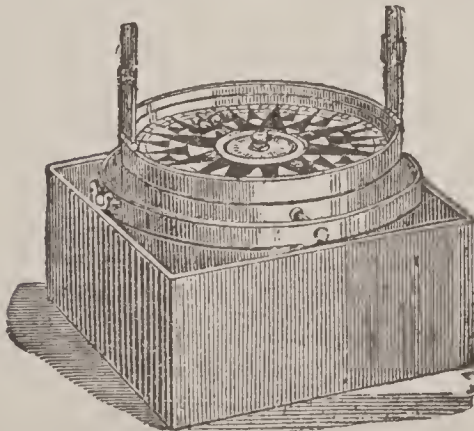
Aye-Aye
Azimuth



Aye-Aye.



Head and Fore-feet of Aye-Aye on larger scale.



Azimuth Compass.

AYLESBURY—AYLOFFE.

but this statement is improbable. She was accused of adultery, but Mohammed having produced a revelation from heaven to the effect that she was innocent, punished her accusers, and made it an article of faith for all time, that whoever should not believe in her purity should endure the pains of hell forever. In his last illness, Mohammed, by his request, was carried to her house, and expired in her arms. After the Prophet's death, A. was active in the plot which deprived Caliph Othman of his power and life, and headed a force to resist the accession of Ali. After some partial success, however, the troops under her were effectually defeated by Ali, and she was taken prisoner. Ali spared her life, and allowed her to reside in any town in Arabia she chose, provided she did not interfere with state affairs. She died at Medina. In spite of her political adversities, A. was highly venerated by all true Mussulmans, and named the *Prophetess*, and the *Mother of Believers*. She was consulted on divers points of the Koran, and her interpretations were held to be binding. They have been collected in the *Sunna* (q.v.).

AYLESBURY, *ālz'bēr-i*: ancient town in the centre of Buckinghamshire, on a rivulet which flows into the Thame, an e. branch of the Thames. It was taken from the Britons by the Saxons, 571. Until its disfranchisement by the Distribution of Seats Act, 1885, A., with its hundreds, returned two members to parliament. A. is chiefly an agricultural town, rearing fat ducks for the early supply at high prices of the London markets. Pop. (1891) 8,916.

AYLESFORD, *ālz'ford*: village near the centre of Kent, on the right bank of the Medway; $3\frac{1}{2}$ m. n.e. of Maidstone. Remarkable ancient remains are here. On a hill-slope a mile and a half to the n.e., stands a celebrated ancient dolmen, or burying-place, called Kits Coity House—a small truncated pyramidal chamber, open in front, and formed of four large rude Kentish rag blocks, three of which are uprights, with a slight slope inwards, and the fourth laid on them. Of the side-stones, one is 7 by $7\frac{1}{2}$ ft., 2 ft. thick, and $8\frac{1}{2}$ tons in weight; the second is 8 by $8\frac{1}{2}$ ft., weighing 8 tons; and the third is smaller and more irregular in form. The capstone is 12 by $9\frac{1}{4}$ ft., $2\frac{1}{2}$ ft. thick, and weighs $10\frac{1}{2}$ tons. This dolmen seems to have been the centre of a group of ancient monuments connected by a long stone avenue with another group, 7 m. to the s.e. In this district, on the brow of the chalk-hills on both sides of the Medway, are also large circular sepulchral pits, opening at bottom into one or more chambers. Some of these pits are covered with flat stones, and filled with flints. At A. the Britons defeated the Saxons, 455, and drove them from the island; but early in the 7th c. the Saxons were victorious here.

AYLOFFE, *ā'loff*, Sir JOSEPH: English antiquary of celebrity; abt. 1708–81; b. in the parish of Framfield, Sussex. When the new State-Paper Office was established, 1763, he was made one of the commissioners for the preservation of the state papers. In 1772, he published a valuable work on the national records. He projected, and at his death was

AYMAR—AYR.

engaged in the execution of the work, afterwards continued by Gough, and known as Gough's *Sepulchral Monuments*.

AYMAR, *ā'mār*, JAKUES: b. 1662, Sep., at St. Veran; son of a peasant of Dauphiné; brought up as a mason, but he forsook that trade for the divining-rod, which he used at first to point out springs, hidden treasures, etc. In 1692, A. succeeded in discovering one of the guilty parties in a murder and robbery at Lyons: this gave him fame, and he was called to Paris to exhibit his art before the Prince de Condé; but his power of divination utterly failed him; and being forced to confess himself an impostor, he was sent back in disgrace to his original obscurity.

AYMON, *ā-mon* or *ā-mōn'*: surname of four brothers, Alard, Richard, Guiscard, and Renaud, sons of Aymon or Haimon, Count of Dordogne, who figure among the most illustrious heroes of the chivalric poetry of the middle ages; but their historic existence is questionable, as the deeds attributed to them are so largely miraculous, and the traditions concerning them so inconsistent. Their career belongs to the cycle of marvels of which Charlemagne is the center, and their adventures were the exclusive subject of some of the romantic narratives of Italy in the 15th and 16th c. A novel, *Les Quatre Fils Aymon*, by Huon de Villeneuve, a French poet of the age of Philippe Auguste, details very minutely their exploits. Finally, Ariosto gave the family a poetical immortality by his *Roland*, in which Renaud, the bravest of the four brothers, plays continually the most distinguished part. While some traditions of them have a Provençal origin, the author or authors of the popular German book which Tieck has edited and published, entitled *The Beautiful and Entertaining History of the Four Brothers Aymon, and of their Horse Bayard, with the Deeds and Heroic Feats that they accomplished against the Pagans, in the time of Charlemagne*, seem to have drawn from a different source. Probably the varieties in the legends are due to the fancy and national predilections of the authors, developing modifications from a single tradition.

AYORA, *ā-yō'rā*: town of Spain; province of Valencia; 50 m. s.w. of Valencia. The inhabitants are chiefly employed in husbandry and oil-making. Pop. 5,412.

AYR, *air*: the county town of Ayrshire; on the left bank of the river Ayr, about the middle of the coast of Ayrshire, 40 m. s.s.w. of Glasgow by rail; in a coal district. A. is a clean and handsome town, and its principal streets are well built. To the s., between the town and the race-course, numerous elegant villas have recently sprung up. The spire of the Assembly rooms is 217 ft., and the Wallace Tower 113 ft. high. Three bridges span the river, and connect the town with Newton-upon-Ayr—the 'Auld Brig' and the 'New Brig' (taken down 1877, and rebuilt) of Burns, together with a railway bridge. Part of the tower of the old church of St. John, built 12th c., and turned into a fort by Cromwell, is still standing. A harbor is formed by the estuary of the river, and is protected by piers and a breakwater. A large wet dock has recently been built. The

AYRES—AYRSHIRE.

coasting trade is considerable. The chief export is coal 180,000 to 200,000 tons yearly being exported from the Ayr collieries. Much grain and timber are imported, and two lace factories have been established. At an early date, A. was a commercial and military place of some importance. William the Lion made it a royal burgh about 1202. During the Scottish wars of independence, it formed a regular centre of military operations, and, while in possession of an English garrison, it was the scene (according to *Blind Harry*) of Wallace's first exploits. The principal objects of interest near A. are connected with the memory of Robert Burns. See ALLOWAY KIRK. A. unites with Campbelton, Irvine, Inveraray, and Oban, in sending a member to parliament.

Water for the city was brought from Loch Finlas, 20 m. distant, in 1887. The municipal and parliamentary burgh are now conterminous and include Wallacetown and Newton. Pop. (1881) 21,384; (1891) 25,213.

AYRES, *ärz*, ROMEYN BECK: soldier: 1825, Dec. 20—1888, Dec. 4; b. East Creek, Montgomery co., N. Y. He graduated at West Point 1847, and served in Mexico until 1850, and afterward on frontier and garrison duty. He was promoted to capt. 3d artil. 1861, May, and was chief of artil. 6th army corps. He served with the army of the Potomac on the peninsula, at Antietam, Gettysburg, and elsewhere; and was mustered out 1866 as maj.gen. U. S. vols. He was promoted to col. 3d artil. 1879, July 18.

AYRSHIRE, *air'shir*: extensive maritime county in the s.w. of Scotland; bounded, n. by Renfrewshire; w. by the Firth of Clyde and the North Channel; s. by Wigton and Kirkcudbright; e. and n.e. by Dumfries and Lanark. Its greatest length is 78 m.; its greatest breadth, 26—average 14½; 1,149 sq. m., or 735,262 statute acres. It is the seventh in size of the Scottish counties. The general aspect of the county is undulating and hilly, the land attaining no great elevation, except a small portion in the n., and some considerable tracts in the s. and s.e., which are mountainous. None of the eminences exceed 2,520 ft. A. contains a great number of lakes and small streams, the latter rising near the inland boundary of the county. The chief rivers—only 20 to 35 m. long—are the Ayr, with its tributary the Lugar, and the Doon, which flow across the centre of the county; the Garnock and Irvine in the n.; and the Girvan and Stinchar in the s. A. to the s. of the Girvan consists of Lower Silurian rocks, and to the n. of that river, of patches of Devonian, carboniferous, and trap rocks. It is rich in valuable minerals, especially coal, ironstone, limestone, and freestone. The other minerals have been long wrought, but it is only of late years that the working of ironstone has been established—now carried on on a large scale in the n. of the county. On the banks of the Ayr is found an excellent species of whetstone, called Water-of-Ayr Stone. The climate of A. is mild and healthful, but moist. The soil along the coast is light and sandy, interspersed with deep loam; the most fertile districts are in the centre of the county, where clay predominates. On the e. side are exten-

AYRSHIRE.

sive mosses and moorlands. The three ancient divisions of the county are—Carrick, s. of the Doon, mostly wild and hilly; Kyle, between the Doon and the Irvine, containing much rich level land, but towards the coast the soil is light, and, though well cultivated, is less productive; and Cunningham, comprising all the country n. of the Irvine, mostly fertile. The characteristics of these districts are rudely indicated in the old country rhyme:

Kyle for a man;
Carrick for a coo;
Cunningham for butter and cheese;
And Galloway for woo.

Agriculture in A., till about 1800, was very backward; but since then, especially of late, extraordinary progress has been made in furrow-draining, improved rotation, and road-making; while the condition of the peasants has been much improved. In 1881, 317,719 acres were under crops and grass, held by about 3,500 persons, the farms being generally small. Dairy-husbandry is carried to high perfection in Ayrshire, the breed of milch cows, of which it rears a greater number than any other Scotch county, being noted as the finest in the kingdom for the quantity and quality of their milk. The Dunlop cheese, so called from the parish of that name, is almost as celebrated as Stilton, but is now almost superseded by that made on the Cheddar process. The breed of horses is excellent. Manufactures, especially woolen and cotton, are extensive. At Catrine there are extensive cotton-works; at Kilmarnock, dye-works, iron-foundries, etc.; and at Cumnock, a large pottery. Of the minor manufactures, the most characteristic is that of ornamental woodwork, often bearing tartan designs, which is extensively carried on at Mauchline. Great iron-works are at Muirkirk, Hurlford, Kilwinning, Ardeer, Dalry, and Dalmellington. Maybole manufactures shoes and agricultural implements. There are valuable fisheries on some parts of the coast. Troon, Ardrossan, Ayr, and Irvine are thriving ports. The chief towns, besides Ayr, are Kilmarnock, Girvan, Maybole, Dalry, Kilwinning, Beith, Irvine, Stewarton, Ardrossan, Saltcoats, Troon, Mauchline, Galston, Newmilns, Kilbirnie, and Largs. Of antiquities, the most interesting are the ruins of Crossraguel Abbey, near Kirkoswald, and of the castles of Turnberry, the family seat of Robert the Bruce, Dunure, Loch Doon, Dean, Auchinleck, Dundonald, etc.; also the ruins of Alloway Kirk.

A. was inhabited, in the time of Agricola, by the Damnii, with whom were afterwards mixed the Scots from the opposite coast of Kintyre. In the 8th c., the Northumbrian Saxons seized the territory; afterwards came the Normans, whose traces still exist in local names. During the religious persecutions of the Stuarts, A. was a stronghold of the Covenanters. A. county returns two members to parliament. Pop. (1891) 226,283; (1901) 254,468; number of children, from 5 to 15, receiving education in 1891, 43,917 out of a total of 86,360 under 15.

AYRSTONE—AYUNTAMIENTO.

AYRSTONE, n. *ār'stōn*, a soft variety of whetstone found on the Water of Ayr—called also SNAKE-STONE, from its mottled appearance.

AYTON, *ā'ton*, SIR ROBERT: 1570–1638; b. Kinaldie, Fifeshire: Scottish poet and favorite courtier in the reign of James VI. He took his degree of M.A. 1588, at St. Andrews. From France, 1603, he addressed an elegant panegyric, in Latin versé, to King James, on his accession to the throne of England, which appears to have been the making of A.'s fortune, for he was soon appointed to various positions at court. A. was on terms of familiarity with all the most eminent men of his time—poets, wits, and philosophers alike—among others, Hobbes and Ben Jonson. He was a poet of considerable merit; but many of his effusions being complimentary verses to his friends, are characterized by conceit and extravagant flattery. He was one of the first Scotsmen who wrote in English with elegance and purity. His verses on general topics show something of the refined fancy that characterized Herrick. Burns had a great admiration for some of A.'s pieces, two or three of which he paraphrased. A. is said to have written verses also in Greek, Latin, and French. Several of his Latin poems are preserved in the work called *Deliciae Poëtarum Scotorum* (Amsterdam, 1637).

AYTOUN, *ā'tōn*, WILLIAM EDMONDSTOUNE: 1813–65, Aug. 4; b. and d. Edinburgh: studied at the Univ. of Edinburgh, and was called to the Scottish bar 1840. In 1845, he was appointed Regius prof. of rhetoric and belles-lettres in the univ.; and, 1852, he was appointed to the shrievalty of Orkney and Shetland. He married a daughter of Professor Wilson. During many years Prof. A. was engaged in literary work. His earliest work known is *The Life and Times of Richard I.* He was a master of caricature and parody; and many of the most successful of the *Bon Gaultier Ballads* are understood to be from his pen. In 1849, he published the *Lays of the Scottish Cavaliers and other Poems*, which established his reputation as a poet of the school of Sir Walter Scott, and which has run through many editions—his finest poetical work. Among his subsequent writings are—*Firmilian, a Spasmodic Tragedy*, 1854; and *Bothwell*, 1856, a narrative poem. His edition of the *Scottish Ballads*, 2 vols., appeared 1858. In 1859, he issued in conjunction with his friend, Mr. Theodore Martin, translations of various minor poems of Goethe. He was for many years one of the most frequent and brilliant contributors to *Blackwood's Magazine*. Prof. A. was distinguished at once as poet and humorist. His poems have a ballad-like simplicity and a fiery flow of narration; while his tales—the best known and appreciated of which are *The Glenmutckin Railway*, and *How I became a Yeoman*—have a certain robust humor and farcical abandonment. As a critic, he took up the knout of the dreaded Christopher North of the 'Noctes.' His life has been written by Theodore Martin (Lond. 1867).

AYUNTAMIENTO, *á-yūn'-tâ-mē-ën'tō*: councils or gov-

AZALEA.

erning bodies of towns in Spain. Sprung from the institutions of the Romans, and firmly established during the long struggles with the Moors, the ayuntamientos acquired great influence and political power, the more so that the nobility were not excluded from them. After 1521, their importance began to be impaired, and under the Bcurbons it vanished; still the remembrance of it was cherished by the people. Accordingly, the cortes of Cadiz, 1812, took up the leading features of the former system, adapting them, by more democratic modifications, to the requirements of the time. On the return of Ferdinand VII., the ayuntamientos were abolished; they were again restored by the cortes, 1823; and after the invasion by France, once more set aside. During the civil war, various proposals were made regarding the ayuntamientos; but at last the arrangements of 1812 were confirmed by the constitution of 1837. According to that statute, the A., with the alcalde as president, is appointed by the free choice of the people, and is entitled to exercise the highest functions within the circle of its jurisdiction. The government can provisionally annul its acts, but must afterwards procure the ratification of the cortes, by which alone an A. can be dissolved. The ayuntamientos are empowered to make up the lists of electors and jurors, to organize the national guard, to command the police within their own bounds, to direct the apportionment and raising of taxes, and to manage the funds of the commune. In 1840, a bill was brought into the cortes, formed on the model of the French law, proposing to deprive the ayuntamientos of all political power, and restrict their functions to purely municipal matters, and also to limit the franchise to the most highly taxed. But the insurrection which this step excited and which ended in the expulsion of the queen, Maria Christina, prevented the project from being carried out. At last, 1844, a law, similar to that proposed in 1840, was through the intriguing of Christina, supported by French influence, adopted by the cortes, then composed of moderados; and this law, with little alteration, continues in force to the present day.

AZALEA, n. *áz-ál'ě-ă* [Gr. *azalěōs*, dry, parched—in allusion to the dry habitat of the plants—from *azō*, I dry or parch]: genus of plants, nat. ord. *Ericææ*; distinguished from *Rhododendron* (q. v.) chiefly by the flowers having five stamens instead of ten. Most of the species of A. also differ from the rhododendrons in having thin deciduous leaves. Some botanists unite the genus *A.* to *Rhododendron*. One of the species best deserving of notice is *A. Pontica*, a shrub from three to five ft. high, native of the countries around the Black Sea with large obovate or oblongo-lanceolate shining leaves and umbellate yellow flowers, externally covered with glutinous hairy glands, and very fragrant. It may be regarded as, like many of the other *Ericææ* (heaths, etc.), a *social* plant; and its golden flowers give great brilliancy to the landscape in many parts of the Crimea, the s.e. of Poland, the Caucasus, etc. It covers many mountain slopes, but does not ascend to any great elevations, giving

AZALEA.

place to the more alpine *Rhododendron Ponticum*. It is common in gardens and shrubberies in Britain, and varies with orange, red, and almost white flowers. The whole plant is narcotic and poisonous, and the honey collected by bees from its flowers, which very much abound in honey, is said to cause stupefaction and delirium, as happened to Xenophon's soldiers in their famous retreat in Asia.—N. America abounds in azaleas as well as in rhododendrons, and some of the species have been long cultivated in Britain, particularly *A. nudiflora* and *A. viscosa*—the native colors of the first varying from pink or flesh to purple; the other, white to rose—beautiful flowers, of delicious



Azalea Indica.

fragrance. *A. viscosa*, the Clammy or White Swamp Honeysuckle, Me. to Ky., has flowers after leafing, like the Smooth A. of the Alleghany Mts. (*A. arborescens*), whose calyx is long-lobed. *A. nudiflora*, the Purple A. or Pinxter-flower of swamps, Mass. to Ill. and s., is smaller, 2-6 ft. The Flame-colored A. (*A. calendulacea*), native of the s. parts of the United States, is described as frequently clothing the mountains with orange or living flame.—India and China produce several species of A., of which one of the finest is *A. Indica*, well known as a greenhouse shrub. Its flowers have great brilliancy of colors. Many hybrids exist between the more hardy species and this. Another extremely beautiful species is *A. ledifolia*, an evergreen from China.

AZALEINE—AZEGLIO.

A diminutive, procumbent, evergreen shrub, native of alpine regions in Europe and N. America, plentiful on high mountains in Scotland, was long known as *A. procumbens*, but is now called *Loiseleuria procumbens*. The flowers are small and rose-colored. The whole appearance of the plant widely differs from that of the genus *Azalea*.

AZALEINE, n. *a-zā'lē-in*: the dye rosanaline.

AZAZEL, n. *ă-zā'zēl* [Heb. *azazel*—in the opinion of Gesenius, the same as *azazel*—from *azal* (disused in Heb., but occurring in Arab.), to separate]: a word of uncertain meaning, but probably meaning dismissal or removal—occurring in Lev. xvi. 8, 10, 26; in *Milton*, an evil spirit, standard-bearer to Satan.

AZEDARACH, n. *a-zēd'a-rāk* [Arab., *azedarach*]: in *pharm.*, the bark of the root of a tree, *Melia azedarach*.

AZEGLIO, *ăd-zāl-yo*, MAS'SIMO MARQUIS D': famous as artist, publicist, romance-writer, and statesman: 1798–1866, Jan. 15; b. Turin, descendant of an ancient and noble family of Piedmont. His early study of music and painting was cut short by his father procuring him an appointment in a Piedmontese cavalry regiment, but illness forced him to quit the service. Soon after 1820, he devoted himself to painting, and in a year made himself a name in Rome. In landscape-painting he soon attained complete artistic skill. He was also a student of history. Removing to Milan, 1830, he began to make himself favorably known also in literature, his novels, *Ettore Fieramosco* (1833), and *Niccolo de' Lapi* (1841), having done much to raise the national spirit of the Italians. The political affairs of Italy soon occupied him exclusively; he traversed the provinces, cities, and villages, seeking to stir up the spirit of patriotism, and to conciliate the unhappy party divisions, and was everywhere received with acclamation. A. never belonged to a secret political society, but opposed conspiracies as mischievous, and exhorted the impatient to moderation. While in Florence, he wrote his famous piece, *Degli ultimi Casi di Romagna*, in which he lashed the papal government, denounced the vain attempts at insurrection, and proved to the Italian princes the necessity of a national policy. After the election of Pius IX. as pope, A. returned to Rome, and to his influence were ascribed the reforms with which Pius began his government. He was intensely active at this time, and wrote much on public questions. (An edition of his political writings, in one volume, appeared at Turin, 1851). When Charles Albert, after the rising of Lombardy, crossed the Ticino, A. left Rome with the papal troops destined to support the Italian contest. In the battle of Vicienza, where he commanded a legion, he was severely wounded in the leg while fighting at the head of his troops. Scarcely was he recovered, when with his pen he courageously opposed the republican party, now intoxicated with victory. On the opening of the Sardinian parliament, he was chosen a member of the chamber of deputies. After the unfortunate event of the battle of Novara, the young king, Vic-

AZERBIJAN—AZIMGHUR.

tor Emanuel II., appointed him (1849) president of the cabinet. At the close of the war, 1859, A. was appointed *pro tempore* general and commissioner extraordinary, purely military, for the Roman States. He died 1866, Jan. 15. Since his death, *Political Correspondence*, and other writings from his pen, have been given to the world; and his *Autobiography* has been published by his daughter.

AZERBIJAN, *â-zér-bî-jân'*, or ADERBAIJAN, *â-dér-bî-jân'*: ancient *Media Atropatene*; most northerly province of Persia; between lat. 36° and 40° n., long. 44° and 48° $40'$ e.; bounded on the s. by Persian Kurdistan and Irack, e. by Ghilan, n.e. and n. by the Russian territory, and w. by Turkish Urdistan; about 30,000 sq. m. The surface is very mountainous, many of the ranges rising from 7,000 to 9,000 ft. in height. The peak of Savalan (an extinct volcano) reaches an elevation of 13,000 ft. Mount Ararat rises on the n.w. border. The chief rivers of A. are the Aras or *Araxes*, the Kara Su, and the Kizil-Uzen. The salt lake Urumiyah or Urumieyeh (q.v.), the largest in Persia, is on the w. border of the province. The climate of A. is not unhealthful, but is subject to the extremes of heat and cold. In the mountainous districts, the hailstorms are occasionally so violent as to kill cattle. The principal products of A. are rice, barley, wheat, maize, flax, hemp, cotton, tobacco, honey, and saffron; camels, horses, cattle, and sheep are reared; velvet, silks, stuff, carpets, woollens, and leather are the most important articles of manufacture. Lead, iron, copper, sulphur, saltpetre, and salt are found in the province. The capital of A. is Tabriz, pop. abt. 120,000. It has suffered greatly from earthquakes. The other towns of note are Urumiyah, on the lake of that name; Maragha, famous as the place where Nasir Eddin, the astronomer, fixed his observatory; Miana, Khoi, Selmas, and Ardebil. Pop. of A. 2,000,000.

AZIMABAD, *â-zim-a-bâd'*, or TIROWLI: town of Sirhind, India; on the route from Kurnal to Lodiana; 9 m. n.w. from Kurnal; slightly elevated above the neighboring plain, which is inundated in the rainy season.

AZIMGHUR, *âz'im-gŭr'*, or AZIM'S FORT: name applied primarily to a town in India; thence extended to its district, forming one of the N.W. Provinces.

The town is in lat. 26° n., long. $83^{\circ} 14'$ e. From Calcutta, it is 448 m. to the n.w.; from Benares, 81 to the n.; from Allahabad, 109 to the n.e.; and from Lucknow, 171 to the s.e. It is on the n.e. Tons, a considerable offset of the Gogra, here crossed by a bridge of boats, and navigable 40 m. below, to its confluence with the Surjoo. During the mutiny of 1857, A. was an exception to the general rule of ruthless cruelty among the insurgents. Pop. (1891) abt. 15,893, besides troops in garrison.

The district stretches in n. lat. between $25^{\circ} 36'$ and $26^{\circ} 24'$; e. long. between $82^{\circ} 45'$ and $84^{\circ} 12'$. The district is low and remarkably level. The soil is fertile, excepting that a few tracts are irreclaimably barren, being impregnated with soda, nitre, and other saline substances. Mag-

AZIMUTH—AZINCOURT.

rich crops of rice, sugar-cane, and indigo are produced. The principal manufactures are those of silk and cotton, the value of which amounts to more than £100,000 a year. The area is stated at 2,550 sq. m.; the pop. at 1,531,410—giving the remarkably high average of 600 persons to the sq. mile.

AZIMUTH, n. *ăz'ĭ-mŭth* [Ar. *al-samt*, a way or path; *assamut*, ways or paths]: in *astron.*, the angle measured along the horizon between the north or south point, and the point where a circle, passing through the zenith and the body, cuts the horizon. It is usual to measure the A. westward from the point most remote from the elevated pole, beginning at 0°, and returning to it at 360°. Thus; in n. latitudes, where the n. pole is elevated, the A. is measured from the s. point, so that the e. point, for instance, has an A. of 270°. See **ARMILLARY SPHERE** (under **ARMILLA**). Azimuth circles are those which extend from zenith to nadir, cutting the horizon at right angles, or those in which all the points have the same azimuth. **AZIMUTHAL**, a. *ăz'ĭ-mŭth'ăl*, pertaining to. **AZIMUTH AND ALTITUDE INSTRUMENT**, astronomical instrument for ascertaining the altitudes and azimuths of the heavenly bodies at any particular time. It has two axes, the principal one vertical and the other horizontal; the former, therefore, corresponding to a vertical circle of the heavens, and the latter to the celestial horizon. The angles measured on the latter are therefore azimuths or differences of azimuths, and those on the former zenith distances, according as the graduation is from the upper point of the limb, or a point distant from it 90°. **AZIMUTH COMPASS**, an instrument adapted for observing bearings, consisting of a magnetic bar or needle moving freely in a horizontal plane on a vertical pivot.

AZINCOURT, *ă-zăn-kôr'*, or **AGINCOURT**, *ă-zhăn-kôr'*: village in the dept. of Pas-de-Calais, France, celebrated for a bloody battle between the English and the French, 1415, Oct. 25. The internal distractions of France under the imbecile Charles VI. (q.v.) had encouraged England to attempt to make good her ancient claims on France. Henry V. of England had landed at Harfleur, had taken that fortress, and wished to march through Picardie to Calais, in order to go into winter-quarters. The Dauphin advanced against him with a powerful force. A great number of the nobility accompanied him; and so great was their confidence, that the offered aid of the Duke of Burgundy and of the city of Paris was rejected. Henry hastened to the Somme, but was followed by the French, who opposed his passage; he at last managed to cross with his army at St. Quentin. Greatly weakened in numbers, and suffering extremely from want of provisions, Henry offered to purchase peace by reparation of injuries. But the French would not hear of a treaty, as they entertained the hope of annihilating the English army. They had, in fact, intercepted the English march to Calais, by taking possession of the high road behind the little river Ternoise, near

AZOBENZOIC—AZOIC.

the villages of A. and Framécourt. The invading army, therefore, still (according to French accounts) 14,000 strong, of whom 2,000 were men-at-arms—though no English writer makes it more than 10,000—prepared for an engagement by posting themselves between two woods, in a single line of battle, with the archers on the wings. The French, to the number of 50,000, under the command of the constable, D'Albret, were drawn up in two lines, the men-at-arms, of whom only 2,000 were mounted, being in the first. The English began the onset. The French cavalry rushed forwards to meet them, but were received with such a storm of arrows that they took to flight, threw themselves upon the first line, and put it into disorder. On this, the light-armed English archers took to their bill-hooks and hatchets, broke into the ranks of the men-at-arms that fought on foot, whose heavy armor and close array rendered them almost incapable of resistance, and made the greatest havoc among them. This being followed by a charge of the English horsemen, the first line took to flight, the second was unable to arrest the victors, and the whole French army was soon completely dispersed. The victory was decided. For a moment, Henry believed that the rallying masses were going to renew the fight; and hearing also that a troop of armed peasants were plundering his baggage, he gave orders to slay all the prisoners taken. The order was already executed when he discovered the groundlessness of his alarm. As many as 10,000 Frenchmen were slain, among whom were the constable and six dukes and princes, the Duke of Brabant, the Count of Nevers, the Duke of Alençon, the Duke of Bar and his two brothers. Five princes, among them the Dukes of Orleans and Bourbon, were taken prisoners. The English lost 1,600 killed, including the Duke of York, the king's great-uncle, whom the Duke of Alençon slew. Alençon had even struck the crown from King Henry's head, when he was surrounded by all present, and fell with many wounds. Henry, however, was too weak to pursue his advantage, and therefore continued his march to Calais, where he embarked for England.

AZOBENZOIC, a ăz-ō-běň-zō'ík [Eng. *azo(te)*; *benzoic*]: pertaining to nitrogen, and also to gum benzoin, a resin produced from *Styrax benzoin*, a tree from the Malay archipel-

ago. AZOBENZOIC ACID, n., in *chem.*

$$\begin{array}{c} \text{NC}_6\text{H}_4\cdot\text{CO}\cdot\text{OH} \\ || \\ \text{NC}_6\text{H}_4\cdot\text{CO}\cdot\text{OH} \end{array}$$

Obtained by the action of sodium amalgam and water on nitro-benzoic acid. A yellow solid, almost insoluble in alcohol, ether, or water; it forms sparingly soluble salts.

AZOIC, a. *ă-zō'îk* [Gr. *a*, without; *zōē*, life; *zōtîkos*, fit for preserving life]: without life; wholly destitute of life. AZOTE, n. *ăz'ôt*, name given by French chemists to nitrogen gas, which is unable to support life. AZOTIC, n. *ă-zôt'îk*, pertaining to. AZOTIZED, a. *ăz'ô-tîz'd*, containing nitrogen or azote.

AZOIC PERIOD—AZORITE.

AZO'IC PERIOD, or AZOIC AGE: see ARCHÆAN PERIOD.

AZOPHOSPHORIC, a. *áz-ō-fōs-fōr'ik* [Eng. *azo(te)*; *phosphoric*]: pertaining or relating to azote and phosphorus in combination.

AZORES, *a-zōrz*: cluster of islands in the Atlantic, 800 m. due w. of the s. half of Portugal; ranging in n. lat. between $36^{\circ} 55'$ and $39^{\circ} 44'$, and in w. long. between $25^{\circ} 10'$ and $31^{\circ} 16'$. In the first half of the 15th c., the A. were discovered by the Portuguese, or rather, it has been said, appropriated by them, after having been revealed to them by a Flemish navigator, Joshua Vanderberg, of Bruges. They were at that time uninhabited—a fact which seems adverse to any notion that America had originally been colonized from Europe in this direction. That the A. were visited by the Carthaginians is proven by Phœnician coins found on Corvo. As early as 1436, they are marked on a map of the world by the Venetian Andrea Bianco. The Portuguese colonists called the whole group A., from *acor* or *azor*, a hawk; and they named two individual islands Corvo and St. Jorgo, from *Corvos Marinos* and St. Jorsi, which, according to the maps of the 14th c., had been previously seen in the western ocean. In 1466, Alfonso V. made a life-grant of the island of Fayal to his aunt, the Duchess of Burgundy, and this led to a migration thither of many settlers from Flanders. Without reckoning mere rocks, the islands are nine in number. From e. to w. they are as follows. St. Mary, St. Michael, Terceira, Graciosa, St. Jorgo, Pico, Fayal, Flores, and Corvo. Area estimated at 920 sq. m. In the order of population and importance, the islands stand thus: St. Michael, Terceira, Pico, Fayal, St. Jorgo, Flores, Graciosa, St. Mary, and Corvo. The A. form a province of Portugal. Their capital is Angra, in Terceira; but Ponta Delgada and Ribeira Grande, both in St. Michael, are larger towns.

As may be presumed from the density of the population, the soil is fertile, the climate healthful, and the islands are well watered. Exports are oranges, wine, brandy, grain, pulse, pork, beef, cheese, and coarse linens; and imports are woollens, cottons, hardware, iron, glass, cordage, pitch, tår, staves, timber, oil, fish, rum, coffee, sugar, salt, and tea. Perhaps the greatest want of the group is a good harbor. The A. are of volcanic origin—a fact from which may probably be inferred their identity with the Isles of Brazil or of Fire in the maps above mentioned, of the 14th c. Though most of the volcanoes appear to be extinct, the islands contain hot springs, and are subject to violent earthquakes. The coasts are generally steep and rugged, while the interior parts abound in ravines and mountains. The mountains range from 1,869 ft. to 7,613—the latter being the height of the lava-covered *peak* which gives name to *Pico*. Pop. of the group (1890) 255,511; average 292 to a sq. mile; (1900) 256,474.

AZORITE, n. *az-ōr'it* [from the *Azores* islands]: a white mineral, translucent or opaque, crystallizing in minute octahedrons. The hardness is 7 +; the lustre vitreous on

AZOTINE—AZOV.

fracture. It has been proved to be zircon; the minute pyramids implanted on sanidine-trachyte, etc.; some, green.

AZOTINE, *ăz'o-tîn*: substance procured by decomposing wool by the action of steam at 150° C. under a pressure of five atmospheres: the product, afterwards dried by evaporation, contains nitrogen completely soluble in water. A. is mixed with dried blood for a fertilizer.

AZOTIZED BODIES, *ăz'o-tîzēd*: substances which contain azote or nitrogen as one of their constituents, and which form part of the living structure of a plant or animal, or are produced during its natural decay. The principal members of the group are *albumen*, present in white of eggs, and the juices of plants and animals; *globuline*, or *crystalline*, a variety of albumen found in the lens of the eye; *vitelline*, another variety of albumen, composing the greater bulk of the yolk of the egg; *paralbumen*, a third variety of albumen found in the animal system during certain diseases; *fibrine*, abundant in the seeds of cereals and in animal muscle; *caseine* (or cheese matter), present in all milk; *legumine*, a variety of caseine found in peas, beans, and leguminous seeds in general; *gelatine*, present in the skin, bones, and other parts of animals; *chondrine*, a variety of gelatine obtainable from the cornea of the eye and the permanent cartilages; *isinglass*, another variety of gelatine manufactured from the inner membrane of the floating bladder of sturgeons and other fishes; *glue* and *size*, secondary forms of gelatine; *urea*, *uric acid*, and *hippuric acid*, present in the urine of the higher animals; *kreatine* and *kreatinine*, occurring in the juice of flesh; several forms of *urinary calculi*, found as stones in the bladder; and the very large and important class of *alkaloids*, including strychnine, morphine, quinine, etc. For the principal Azotized Bodies, see their titles: for the use of several of them for food, see **Food**.

AZOTURIA, n. *ăz'ō-tū'rî-ă* [Eng. *azote*; Gr. *ouron*; L. *urīna*, urine]: an excess of urea in the urine; a disease of animals arising from a too rapid disintegration of tissues, or a defective assimilation of food.

AZOTUS, *a-zō'tūs*: the *Ashdod* of the Old Testament (now Esdud): village on the Mediterranean, 21 m. s. of Jaffa; lat 31° 45' n., long. 34° 37' e. It was formerly one of the chief cities of the Philistines, strongly fortified, and the scene of numerous contests between that race and the Jews. Into this city the Ark of the Covenant, captured in war, was brought by the Philistines, and placed in the temple of their god Dagon, whose image fell in pieces before it. In B.C. 8th c. the town fell into the hands of the Assyrians; and in the 7th c. was captured by the Egyptians, after 29 years' blockade and siege. In the wars between Alexander Balas and Demetrius, A. was destroyed by fire. It was afterwards rebuilt by the Romans, but never regained its early importance, and the sea is gradually receding from its harbor. Pop. abt. 300.

AZOV, or Asow, *ă-zōv'* or *ăz'ov*: fortress and port-town in the s. of Russia; on the Don, about 20 m. from its

AZOV—AZTEC CHILDREN.

mouth. The sand and mud deposited by the river have choked up the port so that its trade and shipping have dwindled away, and the inhabitants depend mostly on fishing. A. was anciently a Greek colony, under the name of Tanaïs, and had extensive commerce with the northern peoples. In number of inhabitants and in wealth it often rivalled Panticapæum (now Kertch). In the 13th c. it was taken by the Genoese, who called it Tana. They were driven out of it by Timur (Tamerlane), 1392. In 1471, it was taken by the Turks, and since then has borne the name of A., the Turks calling the town and the neighboring sea Asak. After an obstinate struggle, at which Peter the Great, then beginning his career, was present, it was captured by the Russians about the end of the 17th c. More than once it fell again under the dominion of the Turks, but since 1774 has remained in the possession of Russia. It was bombarded and nearly destroyed by an allied English and French squadron in 1855. Pop. 18,738.

AZOV, SEA OF [named after the town]: a large gulf of the Black Sea, formed by the peninsula of Crimea, or rather an inland lake connected with the Black Sea by the long, narrow strait of Kaffa. The Siwash or Putrid Sea is the w. portion of the Sea of A. cut off by the long, narrow slip of low, sandy land called the Tongue of Arabat. The entrance to the Putrid Sea is by the narrow strait of Genitschi at the n. of the Tongue. The Putrid Sea is little but a succession of swamps. The ancient name of the sea of A. was *Palus Mæotis*. It gets the name of *Balik-Denghis*, or Fish-sea, from the Turks and Tatars, from its abundance of fish. The water is almost fresh. The whole sea is shallow, and occupies an area of about 14,000 sq. m. During the Crimean war, an expedition, having on board 16,500 English, French, and Turks, was sent to this sea, 1855, May, which devastated the ports, and cut off supplies intended for Sebastopol.

AZRAEL, n. *ăz'ra-ël*, or AZRAIL, *ăz'ra-îl* [Arab., Turk., etc.]: the angel of death.

AZTEC, a. n. *ăz'tĕk*: one of the Aztecs, an early race of Mexico, the dominant tribe, inhabiting its great plateaus at the time of the Spanish invasion, and far advanced in the arts and civilization. See MEXICO, ANTIQUITIES OF.

AZTEC CHILDREN, *ăz'tĕk*: two children (a boy and a girl) exhibited, 1853 and later, in this country and Great Britain, as descendants of the old ruling race in Mexico. They were said to be respectively 17 and 11 years of age, and to have been brought from the ancient city of Iximaga, Central America, where they were worshipped as gods. The height of each was under three ft. Their figure was slender and not ill-proportioned. It was chiefly remarkable that while the forehead and chin receded, the nose was so singularly prominent as to suggest the idea of the face of a bird. Yet, with dark, lively eyes, an olive complexion, and glossy, long, black hair, and a great fund of good-nature, they were far from unpleasing. They spoke

AZUA—AZURE.

no intelligible language, but understood a few words of English, and seemed to have a taste for music. Shown to the public as curiosities, they were usually exhibited on a large table, on which they ran about amusing themselves. In England Prof. Owen considered them mere dwarfs, and other authorities on both sides of the Atlantic held a similar opinion. Belonging probably to some Indian tribe, they were doubtless monstrosities.

AZUA, *â-zô'â*: town of the island of San Domingo, not far from the s. coast; on the Bia, and near its mouth, 60 m. w. from St. Domingo. Pop. 6,000.

AZUAGA, *â-thô-â'gâ*: town of Estremadura, Spain; province of Badajos; 20 m. e. from Llerena. Pop. 8,400.

AZULMIC, a. *a-zôl'mîk* [Eng. *az(ote)*; *ulmic* -- from *ul-min*]: nitrogenous and ulmic (humic). See HUMUS.

AZUNI, *âd-zô'nê*, DOMENICO ALBERTO: 1749, Aug. 3.—1827, Jan.; b. Sassari, island of Sardinia: distinguished jurist, especially in law concerning the maritime relationships of nations. He was judge of the Tribunal of Commerce at Nizza or Nice; and 1795, after that city had been taken by the French, he published a work in which he endeavored to reduce maritime laws to fixed principles, and which, being recast, was published at Paris, 1805, under the title of *Droit Maritime de l'Europe*. The work was sufficiently anti-British in tone to secure its author the favorable consideration of Napoleon, by whom he was appointed commissioner for compiling the maritime portion of the new commercial code. Genoa was annexed to France, and A., 1807, was appointed pres. of the court of appeal there, where he remained until the fall of Napoleon. Among A.'s works are *Essai sur l'Histoire Géographique Politique et Morale de la Sardaigne*, and a *Dictionary of Mercantile Jurisprudence*, and some conversational brochures.

AZURARA, *â-zô-râ'râ*, or ZURARA, *zô-râ'râ*, GOMEZ DE: a Portuguese historian; 15th c. He was keeper of the archives, and was charged by Alphonso V. to write the history of the kingdom. A tradition attributes to him the destruction of a great number of papers and documents contained in the archives, in 1459, upon the demand of the Cortes, and with the only aim of getting rid of papers considered useless. Fortunately many of these fragments had been copied by different municipalities for administrative uses. The writings of A. are numerous. The most important is a *History of the Discovery and Conquest of Guinea*, reprinted, Paris, 1841; of which a magnificent manuscript is preserved in the Library of Paris.

AZURE, n. *âzh'ér* [Fr. *azur*: It. *azzurro*, blue—from Pers. *lazur*]: the blue color of the unclouded sky; a blue pigment of a greenish tint; in *heraldry* A. is technically used to signify blue; and in engraving arms it is always represented by horizontal lines: ADJ. of a sky-blue color; v. to color azure. AZURED, a, *âzh'êrd*, being of an azure color. AZURN, a. *âzh'êrn*, of a blue color. AZURINE, n. *âzh'û-rîn*, a fresh-water fish (*Leuciscus caeruleus*)—so named

AZYGOUS—AZZUBEYDI.

from its color: of the same genus with the roach, chub, etc., and most nearly resembling the Red-eye (q.v.) or Rudd (*L. erythrophthalmus*), from which, however, it is readily distinguished by the slate-blue color of the back, and the whiteness of the abdomen and fins: found in Lancashire, Eng., also in some of the lakes of Switzerland. **AZURE-STONE**, so named from its color; a familiar name for the lapis-lazuli. **AZURITE**, n. *ăz'û-rīt*, name given to the mineral more commonly called Lazulite (q.v.), and to which, with Lapis Lazuli (q.v.) or *Azure-stone*, mineral turquoise (see **TURQUOISE**), etc., the generic name *Azure Spar* is sometimes given.—The name **A.** is given by Dana to the blue copper-carbonate only, which differs from malachite in having more carbon-dioxide and less water. Beautiful crystals occur in the Arizona mines and elsewhere.

AZYGOUS, a. *ăz'î-gŭs* [Gr. *a*, without; *zugon*, a yoke]: in *anat.*, without a fellow or corresponding part.

AZYMITES, n. plu. *ăz'î-mīts* [Gr. *a*, without; *zŭmē*, leaven]: those Christians who use unleavened bread in the Lord's Supper. **AZYMUS**, a. *ăz'î-mŭs*, unfermented or unleavened—applied to sea-biscuit. **AZYME**, n. *ăz'îm*, unleavened bread.

AZZARKAL, *ăz-zar-kâl'*: first half of 11th c.; b. Cordova: Arabian mathematician and astronomer. He was royal astronomer of Al-Mamoun, King of Toledo. He invented divers instruments for making observations, constructed a water-clock of extraordinary dimensions, as well as a planisphere and an astrolabe, upon new principles. The library of the Escorial possesses an Arabic manuscript (No. 967) that contains one hundred astronomic problems and explanations of the instruments of Azzarkal.

AZZI, *ăt'sē*, **FAUSTINE**: 1650-1724; b. Arezzo: Italian poetess. She had the most brilliant renown in her time and country, and most of the academies of Italy admitted her into their membership. Besides fragments scattered in different collections, she has published a vol. of poems under the title of *Serto Poetico* (1694).

AZZO II., *ăt'so*: d. 1097; son of Azzo I.: one of the most powerful princes of Italy at his epoch; prominent in the events of which the peninsula was the theatre. He had possession at one time of the earldom of Maine, in France.

AZZUBEYDI, *ăz'zoo-bă-dē*, **MOHAMMED IBN EL HASAN**: 927-989; b. Seville: Arabian lexicographer. He was cadi of Seville and preceptor of Hiscam, son and heir of the sultan. He wrote an abridgment of the great biography of the Spanish grammarians, by Khalil; a treatise on grammar, and a work upon the character of the syntax in the Arabic language.

B

B, or **b** *bē*: second letter of the English alphabet, and a consonant: the second letter also in the Hebrew or Phœnician alphabet, and in all alphabets derived from it. It belongs to the order of labials, and is of the kind called medial or flat. See LETTERS: ALPHABET. Its name in Hebrew is *beth*, signifying 'house,' probably because its original hieroglyphic or picture form was an outline of a house or tent. In the corresponding words of sister-languages, we find *b* very generally replaced by some one of the other labial letters [*p*, *f* (*ph*), *v*]; these substitutions, however, take place not by chance or caprice, but according to ascertained laws. See PHILOLOGY, COMPARATIVE: GRIMM'S LAW. The following are examples of the interchange of *b* with other letters: Corresponding to Eng. *beâr* are Skr. *bhri*, Lat. *ferre*, Gr. *pherein*: Eng. *be*, Skr. *bhu*, Lat. *fio* and *fui*, Gr. *phuo*: Eng. *bore*, Lat. *forare*: Eng. *of* and *off*, Gr. *apo*, Lat. *ab*: Eng. *wife*, plural *wives*, Ger. *weib*, Old H. Ger. *wip*: Eng. *web*, *weave*, *weft*: Gr. *episcopos*, Eng. *bishop*, Fr. *evêque*. In several Latin words, *b* arose out of *u* (pronounced like *v* or *u*). Thus, the original form of *bellum*, war, was *duellum* or *dvellum*; of *bonus*, *dronus*; and the *d* being dropped (as we drop the sound of *k* in *knee*), the *v* became hardened into *b*. Similarly, *bis*, twice, is for *duis*. A remarkable interchange sometimes takes place between *b* and *m*, as in Skr. *mri*, to die; Lat. *mort*-, death: and Gr. *brotos*, mortal.

The Greeks pronounced their *b* (β) like a *v*, for they spelled *Virgilius*, e.g., *Birgilios*; and this continues in modern Greek. In Latin, during the classical ages at least, the letter was pronounced as it is in English, French, etc. But in the time of the later emperors (beginning with the 3d c. after Christ), *b* was softened down, in the popular language at least, to a slovenly sound like *v*; for in inscriptions of this period, such spelling as *verra* for *verba*, *miravili* for *mirabili*, are quite common. The distinction between the two sounds being once lost sight of, the letter *b* was frequently substituted for *v*—as *berba* for *verba*, *birus* for *virus*. This softening of *b* into *v* in the middle-age Latin has left traces in the modern Italian and French; as Lat. *habere*, Ital. *avere*, Fr. *avoir*; Lat. *tabula*, Ital. *tavola*. A Spaniard, on the contrary, has a tendency to use *b* instead of *v*; thus he pronounces *vivere* like *bibere*, and *Jovis* as if written *Jobis*.

B, in Music, is the seventh degree of the diatonic scale of C, and the twelfth degree of the diatonic-chromatic scale. In harmony, it is called the major seventh. Ac-

BA—BAAL.

According to the tempered system of tuning, the ratio of B to the fundamental note C is $\frac{8}{15}$. In the ancient diatonic scale, B was never used as a key-note, as its fifth, F, was imperfect. In the German notation, B, is called H, while B-flat is called simply B. B-flat is a half-tone lower than B, and in harmony is called the flat seventh. As a harmonic arising from C, B-flat, as produced by nature, is considerably flatter than in the tempered system of tuning.

BA: in *chem.*, the symbol of the element barium.

BAA, n. *bâ* or *bā* [imitation of cry]: the bleat or cry of a sheep: V. to bleat or cry as a sheep. BAA'ING, imp. BAAED, pp. *bād* or *būd*.

BAAL, n. *bā'āl* [Ar. *the idol*: Heb. *lord*]; BA'ALIM, n. plu. *bā'āl-īm*: Hebrew word signifying *lord*, *owner*, or *master*, and applied as a general title of honor to many different gods. In Hosea ii. 16, it is mentioned as a name which had been given to Jehovah himself; but when used with the definite article, it specially designated the principal male deity of the Phœnicians and Carthaginians, as Baaltis or Astarte was the principal female deity. In connection with Babylon and Assyria, the same deity is spoken of under the name of Bel or Belus. Originally, B. was the god representing the sun as the ruler of nature and the type of its productive powers, and Astarte was the goddess



Fig. 1.—Baal, or Melkart.

From a copper coin of Cossyra in the British Museum.
(Twice the size of the original.)

of the moon. In the later star-worship of the western Asiatic nations, B. was the name of Jupiter, the planet of fate, or, as some suppose, of Saturn. The proper Phœnician name of B., however, was Melkart, Melkrat, or Melchrat, which is usually supposed to mean 'king of the city'—i.e., Tyre; but others consider it a contraction of two words signifying 'king of the earth;' while the learned Selden is of the opinion that it is equivalent to 'strong king.' B. was perhaps the same god as the Phœnician Moloch. The Greeks confounded B. or Melkart with their own Hercu-

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les; and for the purpose of distinction, termed him the Tyrian Hercules. From the earliest foundation of Tyre, he seems to have been the tutelar god of that city, and his worship apparently extended thence until it was prevalent in all the towns of the Phœnician confederation, and was established in their remotest colonies, such as Malta, Carthage, and Cadiz. It also overspread the neighboring countries of Assyria and Egypt. Each country or locality had its B. or chief god. According to Scripture, the temples of this idol (at least in Phœnicia and Assyria) were built on the top of hills, or still more frequently in solemn groves, and sometimes altars were erected to him on the roofs of houses. His priests were numerous. Incense was the most frequent offering presented to him, but we read also of sacrifices of bullocks, and even of children. In 1 Kings, xviii., we read that the priests of B. danced about the altar during the sacrifice, and barbarously cut and mangled themselves, if their god did not speedily answer their prayers.



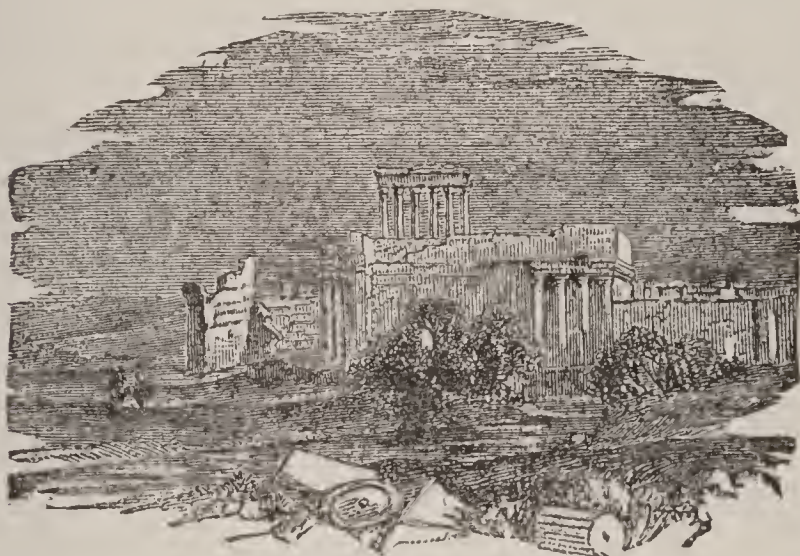
Fig. 2.—Baal:
In a warlike aspect, with four legs, representing the pervading energy and rapidity of the sun.

The word B. enters into the composition of many Hebrew, Chaldee, Phœnician, and Carthaginian names, such as Jezebel, Hasdrubal ('Help of Baal'), Hannibal ('Grace of Baal'), Ethbaal ('With Baal'), Baal-bec ('City of Baal'). The word is also frequently found in conjunction with some epithet, and in such cases appears to have denoted a different deity, though it may have been the same person regarded in another aspect, and as exercising merely a different function. Thus, we have Baal-Berith, 'the Covenant Lord,' who was specially worshipped by the people of Shechem; Baal-Peor, the *Priapus* of the Moabites and Midianites; and Beelzebub, or Baalzebub (the Fly-god); the idol of the Philistines at Ekron, where he had a temple.—The Celtic deity Beal is usually identified with Baal. See BELTEIN.

BAALBEK, *bál-běk'* [*City of Baal*, the Sun-god]: ruined city in the ancient Cœle-Syria; by the Greeks, during the Seleucide dynasty, called Heliopolis: lat. $34^{\circ} 1' 30''$ n., long. $36^{\circ} 11'$ e. It is in the plain of Bukâ'a, 'at the n. extremity of a low range of bleak hills, about one mile from the base of Antilebanon,' in a well-watered and delightful region, rather more than 40 m. n.w. of Damascus. Once the most magnificent of Syrian cities, full of palaces, fountains, and beautiful monuments, it is now famous only for the splendor of its ruins, of which three deserve special notice. The most imposing is that of the great Temple of the Sun, a rectangular building, 290 ft. by 160, having its roof supported by a peristyle of 54 Corinthian columns, '19 at each side, and 10 at each end.' Of these, six yet stand. The circumference of these columns is about 22 ft., and

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the length of the shaft 58; with pedestal, capital, and entablature, they measure about 89 ft. in height. The approach to this temple was through two spacious courts, surrounded on all sides with porticos and other buildings. Except the columns mentioned, little of the great temple, or of the buildings in front of it, is left standing, but the ground is covered with their ruins. The vast size of the stones used in the substructions is remarkable, some of them being 60 ft. long and 12 thick. South from the great



Ruins of Baalbek.

temple is a smaller one, known as the Temple of Jupiter, similar in form, having its peristyle and the walls of its cella still mostly standing. It is 227 ft. in length, by 117 ft. in breadth, being larger than the Parthenon at Athens. Both temples, as well as the surrounding structures, are built of limestone, in a richly decorated, somewhat fantastic Corinthian style. Besides these, there stands at the distance of 300 yds. from the others a circular building, supported on six granite columns; style, mixed Ionic and Corinthian. It was once used as a Christian church.

The early history of B. is involved in darkness; but it is certain that, from the most distant times, it had been a chief seat of sun-worship, as its name implies. Julius Cæsar made it a Roman colony, and under Augustus it was occupied by a Roman garrison. B. had an oracle held in such high esteem that, in A.D. 2d c., it was consulted by the emperor Trajan before his entrance on his second Parthian campaign. To test the prescience of the oracle, Trajan sent to it a blank piece of paper, which was returned to him blank. This gave him a high opinion of its powers, and he consulted it in all seriousness a second time. The response was some dead twigs from a vine, wrapped up in cloth. Trajan's decease some two years afterwards, and the transmission of his bones to Rome, was deemed a sufficient interpretation of the symbolical utterance, and confirmed the celebrity of the oracle. Antoninus Pius (A.D. 138-161) built the great temple, which

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the legend current among the modern inhabitants counts a work of Solomon. This temple is said to have contained a golden statue of Apollo, or of Zeus, which on certain annual festivals the chief citizens of Heliopolis bore about on their shoulders. When Christianity, under Constantine, became the dominant religion, the temple became a Christian church. In the wars that followed the taking of the city by the Arabs, who sacked it 748, the temple was turned into a fortress, the battlements of which are yet visible. The city was completely pillaged by Timur Bey, or Beg, 1400. Both city and temple continued to fall more and more into decay under the misery and misrule to which Syria has been subject. Many of the magnificent pillars were overturned by the pachas of Damascus merely for the sake of the iron with which the stones were bound together. What the Arabs, Tatars, and Turks had spared was destroyed by a terrible earthquake, 1759. B. is now an insignificant village; pop. a few hundred. See Wood and Dawkins's *Ruins of Baalbec* (1757); Cassas, *Voyage Pittoresque de la Syrie* (1799); Murray's *Handbook for Travellers in Syria and Palestine*; Baedeker's *Syria and Palestine* (1875).

BABA, *bâ'bâ*: Turkish word signifying *father*, originating, like our word *papa*, in the first efforts of children to speak. In Persia and Turkey, it is prefixed as a title of honor to the names of ecclesiastics of distinction, especially of such as devote themselves to an ascetic life; it is often affixed in courtesy, also, to the names of other persons, as Ali-Baba.

BA'BA, CAPE: bold, rocky headland near the w. extremity of Anatolia—the Lectum of the Greeks—lat. 39° 29' n., long. 26° 4' e.; about 12 m. from the n. extremity of Mitylene, the ancient Lesbos. On a shelving point of the cape stands the town of Baba, pop. abt. 4,000, where there is some trade in superior cutlery. The once large and prosperous, now utterly ruined, city of Assos, mentioned by the apostle Paul, is in the vicinity.

BABATAG, *bâ-bâ-tâg'*, or BABA DAG, *bâ-bâ-dâg'*: city in the Roumanian Dobrudscha, 2½ m. w. of Lake Razim; in a marshy district. It has a high school and five mosques, of which that built by Bajazet I. is the finest. Bajazet founded the city, which he peopled with Tatars, and named after a saint, whose monument, on a hill near by, is resorted to as a place of pilgrimage. Through the port of Kara-Kerman, a short way to the s., the inhabitants of B. carry on a considerable commerce with the Black Sea. Pop. 10,000.

BABBAGE, *băb'ij*, CHARLES: 1792, Dec. 26—1871, Oct. 18; b. near Teignmouth, Eng.; took his degree of B.A. at Trinity Coll., Cambridge, 1814; and was prof. of mathematics for 11 years from 1828. B. united in happy combination powers of invention and observation with thorough scientific culture. In 1834, he published his extremely correct and well-arranged *Tables of Logarithms*. He was the first to make the method of constructing such tables

BABBITT METAL--BABEL.

the object of earnest study. The difficulty of securing accuracy in preparing large tables led him to attempt to make a machine to do the work (see CALCULATING MACHINE). A result of his inspection of manufacturing establishments was his noted work, *On the Economy of Manufactures and Machinery* (Lond. 1832), in which all processes are classified. He published also: *Comparative View of the Different Life-Assurance Societies; Differential and Integral Calculus; Decline of Science* (1830); *The Exposition of 1851* (1851); *Passages from the Life of a Philosopher* (1864); and papers in the *Transactions* of the Royal Soc. of London and Edinburgh.

BABBITT METAL (see ALLOY): anti-friction alloy of copper, zinc, and tin; used for the interior of boxes, for axles, journals, etc. It was invented 1839 by Isaac Babbitt (1799-1862), of Mass., an inventor, who was awarded a gold medal by the Mass. Charitable Mechanics' Assoc., and \$20,000 by congress.

BABBLE, v. *bāb'bl* [F. *babiller*, to prattle: Dut. *babbel*, babbling; *babbelen*, to chatter: Icel. *babbla*, to babble]: to talk idly; to utter words imperfectly, as children; to tell secrets: N. senseless talk. **BABBLER**, n. *-blēr*, an idle talker. **BABBLING**, imp.: N. foolish talk. **BABBLED**, pp. *bāb'bl'd*. **BABBLEMENT**, n. the act of babbling; the foolish talk which is uttered.—**SYN.** of 'babble, v.': to chatter, prattle; prate.

BABE, n. *bāb*, or **BABY**, n. *bā'bĭ* [W. *baban*; F. *poupée*; It. *bambino*, a babe: Dut. *poppe*, a bunch of flax, a doll: L *pupa*, a doll]: a very young child of either sex; an infant. **BABISH**, a. *bā'bĭsh*, or **BABYISH**, a. *bā'bĭ-ĭsh*, resembling a baby; childish. **BA'BISHLY**, ad. *-lĭ*, or **BABYISHLY**, ad. *bā'bĭ-ĭsh-lĭ*. **BA'BISHNESS**, n., or **BABYISM**, n. *bā'bĭ-ĭzm*, the characteristic quality of a baby; state of being babyish; extreme childishness. **BA'BYHOOD**, n. the state or condition of being a baby.

BABEL, n. *bā'bĕl* [Heb.]: the place where the confusion of languages took place, mentioned in Scripture; confused unintelligible speech arising from many speaking loudly at the same time. **BABEL-QUARTZ**, a variety of rock-crystal.

BABEL, *bā'bĕl*, **TOWER OF**: the building in Babylonia, the scene of the confusion of tongues recorded in Gen. xi. The distinction of being a remnant of the Tower of B. has been claimed for three different masses: 1st, for Nimrud's Tower at Akkerkuf; 2d, the Mujellibe, 950 yds. e. of the Euphrates, and five m. above the modern town of Hillah; 3d, the Birš Nimrud, to the w. of that river, and about six miles to the s.w. of Hillah—all in Babylonia (q.v.). The last of these has a majority of opinions in its favor. According to Mr. Rich, it is oblong, total circumference 762 yds. At the e. side it is cloven by a deep furrow, and is not more than 50 or 60 ft. high; but on the w. side it rises in a conical figure to the elevation of 198 ft.; and on its summit is a solid pile of brick 37 ft. high by 28 in breadth, diminishing in thickness to the top, which is broken and irregular, and rent by a large fissure through

BAB-EL-MANDEB—BABER.

a third of its height. It is perforated by small square holes, disposed in rhomboids. The fire-burnt bricks of which it is built have inscriptions on them; and so excellent is the cement, which appears to be lime-mortar, that it is nearly impossible to extract a brick whole. The other parts of the summit of this hill are occupied by immense fragments of brickwork, of no determinate figure, tumbled together, and converted into solid vitrified masses, as if they had undergone the action of the fiercest fire, or had been blown up with gunpowder, the layers of brick being perfectly discernible. These ruins stand on a prodigious mound, the whole of which is itself in ruins, channelled by the weather, and strewn with fragments of black stone, sandstone, and marble. Sir R. K. Porter has shown that the intense vitrifying heat to which the summit has been evidently subjected must have been the result of fire operating from above, and was probably produced by lightning. This is a curious fact, taken in connection with the ancient tradition that the Tower of B. was rent and overthrown by fire from heaven. Porter thinks that the works of the Babylonian kings, especially the stupendous temple of Belus, erected on the site of the old Tower, concealed for a while the marks of the original devastation; and that now the destructions of time and of man have reduced it to nearly the same condition in which it appeared after the confusion. Mr. George Smith discovered the legend of the building of B. among the Assyrian tablets in the British Museum, and gave an account of it in his *Chaldean Account of Genesis* (1875).

BAB-EL-MANDEB, *bāb'ēl-mān'dēb* [i.e. 'the Gate of Tears']: the strait between Arabia and the continent of Africa, by which the Red Sea is connected with the Gulf of Aden and the Indian Ocean; so called from the danger arising to small vessels from strong currents. The Arabian peninsula here throws out a cape, bearing the same name as the strait, rising to the height of 865 ft. About 20 m. from this cape stands the wall-like coast of Africa, rising in Ras Sejan to the height of 380 ft. Within the straits, but nearer to Arabia, lies the bare, rocky island of Perim (q.v.), now occupied by the English as a fort; the strait on the e. side of this island is called the Little Strait, and that on the w. the Great Strait. The depth of the former varies from 8 to 12 fathoms; that of the latter reaches 185 fathoms. The first is usually chosen by vessels on account of its affording good anchorage. Close to the African coast lie eight small islands, called the Eight Brothers.

BABER, or BABUR, *bā'bér* (Zehir-Eddin Mohammed): first of the Great Moguls in India, a descendant of Timur: 1482-1530. He was barely 12 years of age when he succeeded his father, Omar Sheikh Mirza, in the sovereignty of the countries between Samarkand and the Indus. Gradually he made himself master, by fraud and force, of the provinces of Kashgar, Kundez, Kandahar, and Cabul. Having thus opened the way to India, he made two or

BABEUF—BABINGTON.

three rapid incursions into Hindustan; and finally taking advantage of the feeble government of Ibrahim Lodi, about the end of 1525, he crossed the Attock (the Cabul branch of the Indus), quickly defeated some bodies of troops that opposed him in the Punjab; and at last, 1526, April, on the plain of Panipat, not far from Delhi, encountered and fought a decisive battle with his enemy, whose army was far superior in numbers. The 100,000 men and 1,000 elephants of Sultan Ibrahim were dispersed; Ibrahim himself fled; and B. made his entry into Delhi. In the following month, Agra, the second city of the empire, surrendered. B.'s enjoyment of empire in India was short; and during the five years of his reign he had to contend with numerous conspiracies and revolts. B. had a taste for science and art. He wrote, in the Tatar language, the history of his own life and conquests, translated into Persian by Abdul Rachim, and more recently from the Persian into English. This founder of the B., or Great Mogul, dynasty was succeeded on the throne of Delhi by Humayun, eldest of his four sons.

BABEUF, *bâ'bűf*, FRANÇOIS NOEL (generally known by the name of 'Caius Gracchus,' which he affixed to his political articles), 1764–1797, May 24; b. St. Quentin, dept. of Aisne, France: a fanatic of the revolution which broke out 1789; weak-headed, uneducated, but furiously resolute; the fit tool of abler conspirators. In his journal, established Paris, 1794, July, *The Tribune of the People*, he preached the sovereignty of the masses, and defended the absurdest consequences of that political doctrine: urging a new distribution of the land, the abolition of every political order, and the equality of all individuals, wise and foolish. His violent language caused him to be imprisoned. On his release, he attached himself to the members of the extreme Jacobin party, which had just been overthrown. A secret conspiracy was formed, the aim of which was the destruction of the Directory, and the complete re-establishment of the democratic constitution of 1793, which had been suspended during the Reign of Terror. The plot was discovered through the treachery of one of the members. With other chiefs, B. was seized; and when brought to trial he overwhelmed his judges with abuse. He was of course condemned to death, and was guillotined on the following day.

BABINGTON, *băb'ing-tŏn*, ANTONY; d. 1586, Sep. 20: English gentleman of the county of Derby, head of a conspiracy in favor of Mary Stuart of Scotland. The rivalry between Queen Mary and Queen Elizabeth of England was at the same time a contest between Rom. Catholicism and Protestantism. Accordingly, the various plots for rescuing Mary from the power of her enemy wore the same character, and have been misrepresented and judged of according to the ecclesiastical prejudices of each historian. B., young, rich, a zealous Rom. Catholic, and on that account already an enthusiastic admirer of the unfortunate Mary, was induced, through the agents of a determined

BABINGTONITE—BABOON.

conspirator, Morgan, who had been arrested in France at the instance of the English court, to put himself at the head of a plot that had for its object the murder of Queen Elizabeth, and the rescue of Mary. The execution of the murder was undertaken by one Savage, in which he was to be assisted by a number of the Rom. Cath. nobility, as circumstances might require. The day of action was fixed for 1586, Aug. 24. B. reserved the deliverance of Mary for his own share, entered into correspondence with her, and received letters purporting to be from her in return, approving of the assassination of Elizabeth. The secretary, Walsingham, not only had all the threads of the plot in his hands, but also contributed, through his emissaries, to spur on the conspirators. When the right moment was come, B. and his accomplices were arrested, and condemned. B. made no denial, acknowledged the letters to Mary to be his, and laid his head on the block. Savage, Barnwell, Bollard, Abington, Tichburne, and Tilne, had a like fate. Mary Stuart herself had, four months later, to ascend the bloody scaffold; and her condemnation was justified chiefly on the ground of those letters received by B. Mary, however, denied to the last moment that the letters were written by her hand, or with her knowledge; and her friends constantly maintained that they were the work of Walsingham himself, in order that the unhappy queen might be put to death with a show of justice. The rest of Walsingham's conduct in this affair, as well as his habit and mode of supporting Elizabeth's views in general, give high probability to the accusation.

BABINGTONITE, n. *băb'ing-tŏn-ĭt'* [after *Dr. Babington*]: a mineral (Ca, Fe, Mn, SiO₃) classed between the pyroxene and amphibole groups; crystals small, resembling black augite.

BABOO, rather **BABU**, n. *bā'bô* [Hind. a child, a prince, a master]: a title of respect among Bengalees; any respectable Bengalee; a Hindoo clerk.

BABOON, n. *bă-bŏn'* [Dut. *baviaan*; OE. *babber-lipped*, from its large lips: F. *babouin*, a monkey—from *babines*, the large lips of a beast], (*Cynocephalus*): genus of the Monkey family, or *Simiadae* (see **MONKEY**); distinguished from all the rest of that family by the very elongated muzzle, which terminates abruptly, and is pierced with nostrils at the end like that of a dog. The face has, indeed, a general resemblance to the face of a dog. The dentition agrees with that of the other apes or monkeys of the old world, to which the baboons are entirely confined, being distinguished only by the remarkable strength of the canine teeth. Baboons, like almost all the Monkey family in the old world, have callosities upon the buttocks; and, like the greater part of them, they have cheek-pouches. The tail of some of the species is of considerable length, that of others is a mere tubercle, with an erect tuft of hairs. The physiognomy of all baboons is repulsive, and indicates the fierceness which strongly characterizes them, and in which they differ from monkeys in general; some of the larger ones are dreaded by the in-

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habitants of the countries in which they are found; the danger to be apprehended from them being increased by the numbers in which they usually herd together. Their fore and hind legs are so proportioned, that they walk easily, and run swiftly on the ground; but, like all other quadrumanous animals, they climb trees and rocks with great agility. Their hair is long, forming a sort of mane on the upper parts. All of them are very susceptible of cold, and they seldom live long when removed from their native tropical countries. They feed chiefly on fruits and roots: some of them inhabit barren and stony places where scorpions abound, which they seize, adroitly deprive of the sting, and devour. They are very cunning, mischievous, and revengeful; troops of them sometimes enter a plantation, not merely to plunder, but apparently to amuse themselves by destroying whatever they can find; they seem, however, always to have some appointed to keep watch, and they make off with great rapidity on the first signal of alarm. When plundering, they cram their cheek-pouches before they begin to eat. These cheek-pouches are very capacious: a B., kept in confinement, has been seen to put eight eggs into them at once, and then to take out the eggs one by one, to break them at the end, and deliberately to suck their contents. The larger baboons are sometimes hunted by dogs where they have not trees to take refuge in; but a single dog, however powerful, cannot safely attack them; a baboon will seize a dog by the hind legs, and whirl him round and round till he is stupefied. Baboons are not so easily domesticated as many kinds of monkey; however, they are not quite incapable of it when taken young. 'Happy Jerry,' a mandrill or ribbon-nose B., long a great object of attraction at Exeter Change, used to sit with great gravity in an arm-chair, awaiting orders, which he obeyed with slowness and composure. He smoked tobacco, but did not seem much to relish it, and was rather induced to do it by a bribe of gin and water, for which his fondness was unquestionable.

As examples of baboons with tails of considerable length, may be mentioned the Chacma, or Pig-faced B., also called the Ursine B. (*C. porcarius*), native of south Africa; and the Dog-faced B. (*C. Hamadryas*), native of Arabia, Persia, and the mountains of Abyssinia. The latter species, perhaps the only one known to the ancients, is often sculptured on the ancient monuments of Egypt, and is supposed to have been the species of monkey to which divine honors were paid. Its body was frequently embalmed, and B. mummies are still found.—The Chacma is one of the largest of the baboons, about the size of an English mastiff, and very much stronger: it is common on the mountains of the Cape Colony, and in troops would be very formidable; but they usually scamper out of the way, instead of attacking travellers, unless they are provoked. It is of a dark-brown color, with long shaggy hair. The tail is rather more than half the length of the body, and is terminated by a tuft of long black hair.

The short-tailed, or almost tailless, baboons far exceed



The Sacred Baboon (*Cynocephalus hamadryas*).



Baboon.—The Mandrill (*Cynocephalus Mormon*).

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their longer-tailed congeners in ugliness. Only two species are certainly known—the Mandrill or Rib-nose B. (*C. Mormon*), and the Drill (*C. leucophæus*), both natives of Guinea. The mandrill is the largest, fiercest, and most powerful of the whole genus. The colors of its fur are very fine, of a light olive brown above, and silvery gray beneath; but be-



Mandrill or Rib-nose Baboon.

sides other things unpleasant to the sight, its face is peculiarly hideous; the cheek-bones in the adult males being enormously swollen, so that the cheeks are protuberant to the size of a man's fist upon each side, and ribbed with blue, scarlet, and purple. In their native forests, mandrills generally live in large troops, and are said to put to flight every other wild beast.

BABRIUS, *bā'brī-ūs*: Greek fabulist, who lived about the close of the Alexandrian age, or the beginning of the succeeding Roman-sophistic period. He made a considerable collection of Æsopian fables (see ÆSOP), which he turned into verse, in a natural and popular style. Several versions and transformations of these were made during the middle ages, and have come down to us under the name of *Æsop's Fables*. Bentley was the first to recognize in these fables, and in other quarters, the original work of B. In 1842, a Greek, Minoides Minas, employed by the French govt. to explore the convents of the East, discovered a MS. with 123 hitherto unknown fables of B. pub. Paris 1844. See Lachmann's edition (Berl. 1845), and Rutherford's *Babrius* (1883).

BABY: see BABE.

BABYLON.

BABYLON, *băb'î-lon*—**BABYLONIA**, *băb'î-lo'nî-a*: anciently the flat country about the lower course of the Euphrates, called in modern times Irak-Arabi. In the Old Test. it is called Shinar, Babel, and also 'land of the Chaldees;' and by the later Greek and Roman writers, occasionally Chaldæa. Its proper boundaries were: on the n., towards Mesopotamia, the Euphrates and the Median Wall, which extended from the junction of the Chabur with the Euphrates to the Tigris; on the e., towards Assyria and Susiana, the Tigris; on the s., the Gulf of Persia; and on the w., the desert of Arabia. During the wider extension of the Babylonian dominion, the same comprehended also Assyria and Mesopotamia. The country forms a perfect plain, a continuation of that of Assyria. The two rivers, Euphratēs and Tigris, here approach each other most nearly, until their blended waters fall into the Persian Gulf. The country was anciently protected from flooding by numerous canals and embankments, and several artificial lakes, now mostly in ruin. The most important canal was that now known as Nahr-el-Melik, undoubtedly the ancient royal canal that joined the two great rivers. It was kept in repair by the Roman emperors, and was serviceable as late as the 7th c. The soil, naturally fertile, was rendered more so by the garden-like way in which it was cultivated, and yielded abundant crops, especially of wheat, barley, and dates. The want of stone and wood was felt more severely than in Assyria. The only building material was brick, for which the soil afforded abundance of clay. The bricks were either dried in the sun or burnt, and were very durable, resisting, in the ruins, the effects of the weather to this day. Mineral bitumen, springing up everywhere in abundance, served as mortar. In this favored plain, the human race attained its earliest state of social and political organization.

Until recently, the earlier history of Babylonia was doubtful. The only sources were a few incidental notices in the Bible; some fragments derived at third hand from the perished writings of Berosus, a Babylonian priest, who had translated the annals of his country into Greek; and lastly, the notices of Greek writers, chiefly Herodotus. All was confused and contradictory, and history and mythology were jumbled together.

But in recent years, multitudes of brick tablets, stamped with cuneiform (see CUNEIFORM) characters, have been dug up from the ruins of the great cities that once studded the banks of the Tigris and Euphrates; and on these contemporaneous records of events reaching back 30 centuries before the Christian era, and restoring a lost page of human history.

At the earliest period to which the records reach, the population of the whole valley of the Tigris and Euphrates consisted mainly of tribes of Turanian origin, their language having remarkable affinities with those of the Ural-Altaic group of the Turanian nations, e.g., the Finns, the Magyars, and Turks. Closely allied tribes occupied the

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whole region s.w. of the Caspian Sea—Media, Armenia, Elam, Susiana. In that region lies Ararat, the ‘Mountain of the World;’ and to that region the traditions of those Turanians pointed as the cradle of their race. But the earliest records reveal the existence of a Semitic element in the population of the Euphrates valley, coming in apparently from the s.w.—Arabia and Egypt. The infiltration of this foreign element went on increasing for centuries, until at last it got the upper hand, and the Babylonians and Assyrians, when they became known to the historians of the West, were essentially Semitic peoples. Their civilization, however, was merely a development of what they took up from the original inhabitants.

The dominant people in Babylonia in the earliest times were the Accad, or Accadians. They had come originally from the mountains of Elam, e. of the Tigris, and hence their name Accad, which means ‘highlanders.’ They brought with them the art of cuneiform writing, as well as other arts and sciences, especially astronomy. It is in the Turanian language of these Accadians that the cuneiform inscriptions of Babylonia are written for many centuries. And when the Semitic tongue had become predominant, Accadian, now a dead language, was to the Assyrians what Latin has been to the nations of modern Europe: Assyrian scholars translated the Accadian literature into their own language, and their technical and sacred terms were borrowed from it. Every day is bringing to light new proofs of the influence of these Accadians upon the civilization of the Semitic nations, and through them upon that of Europe. Greece, it is well known, derived its system of weights and measures from the Babylonian standards; but these have been proved to be of Accadian origin. The Greek *mina* or *mna*, the fundamental unit of the Greek monetary system, is the *maneh* of Carchemish, and *maneh* is found to be not a Semitic but an Accadian word, showing the origin of the system. The sexagesimal division of the circle; the signs of the zodiac; a week of seven days, named as we now name them, and the seventh a day of rest, are all Accadian. Every large city had its public library. In the royal library of a Babylonian monarch, Sargon (abt. B.C. 2000), every tablet was numbered, so that the reader had only to write down the number of the tablet he wanted, and it was handed to him by the librarian. Among the multifarious subjects of this extensive literature are hymns to the gods strikingly like the Hebrew psalms; and in a long mythological poem there is an episode giving an account of the Deluge resembling that of Genesis. See ASSYRIA. The Accad religion was originally a Shamanism (q.v.), similar to what still prevails among the Turanian tribes of Siberia; but it gradually developed into a huge system of polytheism, which was adopted and modified by the Semitic inhabitants. The Accadians were great in magic, and the Greek *magos*, a magician, is derived from an Accadian word equivalent to ‘reverend.’

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The city of Babylon was not the first seat of power. The earliest records yet discovered are those of a monarch whose capital was Ur (now Mugheir). Art was already far advanced, and the extent of the monarch's resources is seen in the ruins of the temple of the sun-god built by him; it is calculated that 30,000,000 bricks must have been used in its construction. Centuries, apparently, after this, a fresh invasion from Elam is recorded, to which the exact date can be assigned of B.C. 2280. Another Elamite conqueror, named Cudur-mabug, extended his sovereignty over Palestine; and it is inferred that a sovereign of this dynasty is the Chedorlaomer of Genesis (the name in Accad would be *Kudurlagameri*, 'worshipper of the god Lagamaru'). Some time after this the seat of power was finally fixed at Babylon, and the Semitic tongue began to supersede the Accadian.

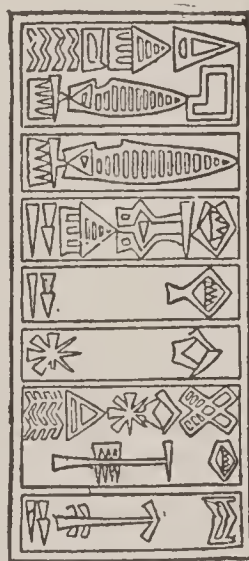
The cities in the n. division of the country had been founded by colonists from the s., and were long ruled as dependencies of Babylonia. At length they grew into the independent kingdom of Assyria; and B.C. 14th c. an Assyrian monarch captured Babylon. From that time the position of the s. state became more and more subordinate to the n., and finally it sank into a province. Babylonia, however, was not always a submissive vassal. Under the leadership of Chaldæan chiefs, it made many struggles for independence. The Chaldæans are first heard of B.C. 9th c. as a small Accadian tribe on the Persian Gulf; but they became so prominent in these struggles that they latterly gave their name to the whole province of Babylonia, which came to be styled Chaldæa. The name of one of those Chaldæan chiefs, Merodach-Baladan, occurs both in Scripture and in the inscriptions. From the former, we know that this king sent a message to Hezekiah, King of Judah, ostensibly to inquire about his recovery, probably with a view to an alliance against Assyria; and from the latter, that Merodach was expelled by Sargon, King of Assyria, that he made a fresh attempt to recover his throne, and was finally dethroned by Sennacherib. The complete subjection of B. to Assyria at this time (B.C. 680) is proved also from the Scripture account, which states that Esarhaddon, son of Sennacherib, reigned in Babylon. About fifty years afterwards, Nabopolassar, governor of B. for the Assyrian king, proved faithless to his trust, and entered into an alliance with the Median king, Cyaxares, for the overthrow of the ruling state. See ASSYRIA. This undertaking was successful, and B. now (B.C. 625) became, though it was but for a short time, an independent and conquering power. The son of Nabopolassar, Nebuchadnezzar II., next defeated the Egyptian king, Necho, at Circesium (Karchemish), on the Euphrates (B.C. 604), and thus annihilated the Egyptian dominion in Asia. He then subdued Jehoiakim, King of Judah; and in consequence of repeated revolts, destroyed Jerusalem, and put an end to the kingdom of Judah under Zedekiah (B.C. 588), carrying the inhabitants captive to Babylon. The Phœnicians submitted to him voluntarily, with the exception of Tyre, which underwent an obstinate siege without yield-



Babylon.—Chaldean Cylinder, Marble or Porphyry. (New York Museum.)



Babylon. — King Merodach-idin-akhi. (From a Basalt Stele in the British Museum, about the 12th century, B.P.)



Babylon.—Inscription upon the Sargon Stone.

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ing. After a fortunate expedition against Egypt, Nebuchadnezzar turned his attention to the adornment of his capital; and the greater part at least of those buildings usually ascribed to a very early period, and especially to the mythical Semiramis, belong to him. After his death (B.C. 562), the Neo-Babylonian empire fell to pieces as suddenly as it had sprung up, and under Nabonedus (Nabunita, in the cuneiform inscriptions, and in Herodotus, Labynetos), who had entered into an alliance with Cræsus of Lydia, against Persia, it came under the dominion of Cyrus (B.C. 539). The Belshazzar of Scripture is thought to be the son of Labynetos, to whom was confided the defense of B., while the elder prince held Borsippa. From this time B. appears on the Persian monuments as a Persian satrapy, under the name of Babirus.

With the overthrow of the Persian monarchy, B. came under the short-lived dominion of Alexander the Great, who died in that city (B.C. 323). Seleucus I., to whom B. had been promised at the conference of Triparadisus, contested and won the possession of it from Antigonus (B.C. 312). About B.C. 140, it was taken from the Syrian monarchs by the Parthians. It came into the hands of the Romans only temporarily, first under Trajan (A.D. 114), under Septimius Severus (199), and again under Julian (363). When, in 650, the successors of Mohammed put an end to the new Persian monarchy of the Sassanides, the province of B., where Bagdad was built (762-766), became the seat of the caliphs till 1258. Since 1638, when the Turks, for the second time, took it from the Persians, it has been under the dominion of Turkey, divided into the pachalies of Bagdad and Basra.

The classic writers represent the civilization of the ancient Babylonians as of a high stamp. The government was despotic, of a kind to suit a crowded, luxurious, and effeminate population. Arts and commerce were flourishing—the last was carried on by caravans with Bactria, Persia, and Media, perhaps as far as India, and by shipping on the Persian Gulf with Arabia. B. was famous for its dyes, its cloths, and embroideries, especially for the manufacture of rich carpets with inwoven figures of strange animals and arabesques, such as we yet see on the Nineveh sculptures. The general prosperity was such, that B. and Assyria together were able to pay to Persia, in the time of Darius Hystaspes, a yearly tribute of 1,000 talents (upwards of \$1,400,000)—a sum greater than that contributed by any other province.

The Babylonians were notorious for their effeminacy, luxury, and licentiousness. Their religion was nearly allied to that of the Phœnicians. The essential part of it was the worship of the powers of nature, as they are manifested in the larger heavenly bodies and in the fertility of the earth. At the head of their system of belief stood Baal (see BAAL), revered through the whole of Mesopotamia and Canaan, who represented, in a general way, the power of nature, without having any moral significance, and was specially identified with the sun. With him stood, as

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feminine complement, the goddess Baaltis, the receptive Earth, with whose worship all manner of licentious rites were associated. She makes her appearance principally as Melyta or Mylitta—i e., 'the causer of generation.' How nearly she is related to Ashtaroth (among the Greeks, Astarte), whose functions are so similar, it is not easy to determine. Education and religion were in the hands of the caste of the Chaldees, who occupied themselves at the same time with astronomy and astrology, and kept records, from the earliest times, of their astronomical observations, associating with them the chronicles of their kings. Their scientific acquirements must have been considerable. Engraved cylinders and gems, and the remains of their pottery, testify to their progress in these departments of arts; and their architecture, according to the testimony of the ancients and the ruins still remaining, deserves to be ranked high.

Apart from canals, bridges, embankments, and sluices, the interest on the subject of Babylonian architecture is concentrated in the ruins of the capital, BABYLON. The accounts that we find in the ancients of the origin, the greatness, and the structure of the city are exceedingly confused. The god Belus is named as its founder, and also Queen Semiramis; how we are to understand the two statements is not explained. Semiramis, according to the account of Diodorus, employed on it two millions of workmen, collected from all parts of her dominions. With the capital of the older kingdom, the accounts of the ancients known to us have, for the most part, nothing to do; they are all to be referred to the resuscitated and adorned residence of Nebuchadnezzar. Herodotus gives a description of the city, apparently from his own observation. It stood on both sides of the river, in the form of a square, the length of whose sides is variously given; by Herodotus it is stated at 120 stadia, making the whole circumference 60 m. It must be remembered, however, that the walls, like those of most oriental towns, inclosed rather populous districts than cities, so that the whole mass of the population might easily find shelter within the space enclosed. It was surrounded by a wall 200 cubits high, and 50 cubits thick, and furnished with 100 brazen gates—the last number is raised by Diodorus to 250. The city was built with extreme regularity, with broad straight streets crossing one another at right angles; and the two parts were connected by a roofed bridge built of hewn stones, fastened together with iron clamps. Of this bridge not a trace has yet been discovered. The western part of the city is undoubtedly the older, belonging to the early and properly Babylonian dynasty. Here stood, in the middle of the city, as it is described, the famous temple of Belus or Baal, called by the Arabs, Birs Nimrúd. See BABEL, TOWER OF. The next important point on the w. side is the mass of ruins called Mujellibe, probably the royal citadel of the old Babylonian monarchy. On the e. side of the river stood the buildings of the Neo-Babylonian period, among which the 'Hanging Gardens' of Semiramis are to be singled out

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as one of the wonders of the world. Of these gardens, Diodorus has left us a detailed description. Their ruins may be recognized in the mound called El-Kasr. The city suffered greatly from the Persian conquest. When it revolted under Darius I., and, after a siege of two years, was recaptured through the ingenuity of Zopyrus, the outer walls were demolished. Xerxes plundered the temple of Belus, which had hitherto been spared, and Herodotus found it empty. Although the Persian kings made B. their residence, nothing was done for the restoration of the city; and Alexander the Great, who, on his entrance, B.C. 331, had promised the inhabitants to rebuild the ruined temple, was unable even to clear away the rubbish, although he employed 10,000 workmen for two months. After his death in the palace of Nebuchadnezzar, and the foundation of Seleucia on the Tigris by Seleucus, Nicator, B. went rapidly to decay. This was partly owing to the new city's being built of the materials of the old, and partly to the want of durable materials for monumental buildings. Stones of any size had to be brought from the mountains of Armenia; their place was mostly supplied by burned brick. As early as the time of Pausanias, there was little to be seen but the ruins of the walls. The older Arabian geographers know, indeed, of a village, Bâbil, but speak more of the great masses of ruins. Since the time of Della Valle, who erroneously looked upon the ruin Mujellibe as the tower of Belus (in which he is followed by Rennel), the site of B. has been the object of many travels and researches. The greater number of the explorers, among whom Rich is the most distinguished, consider the town of Hillah, with 7,000 inhabitants, as the representative of the ancient Babylon. The great masses of ruins, from which we must not, with Rennel, exclude the Birs Nimrûd, embrace, indeed, an enormous extent, but agree perfectly with the accounts of the ancients in being arranged in the form of a square.

Through the discovery in modern times of ancient Babylonian tablets inscribed with cuneiform characters, and the interpretation of the writings by European and American scholars, we obtain clearer insight into the life of the ancient masters of Babylonia, their science, religion, laws, poetry, mythology, and history, than was had by Greek and Roman writers who stood 20 centuries nearer to them than we. Of the tablets discovered many date from more than 2000 years B.C., and of these a large proportion are evidently the work of private persons, and not public records—a fact which shows that the art of writing was in use for other than public ends; and the same inference, with regard to the diffusion of a knowledge of the written language, is suggested by the considerable libraries or collections of inscribed tablets found in the temples. In some of these collections are found tablets that show the student how to ask for the works he requires: all the tablets were numbered and arranged in order in their proper sections. One library, that in the temple of Ea at Eridhu (the sacred city of the god Ea), was a repertory of works on the magic art. Here was discov-

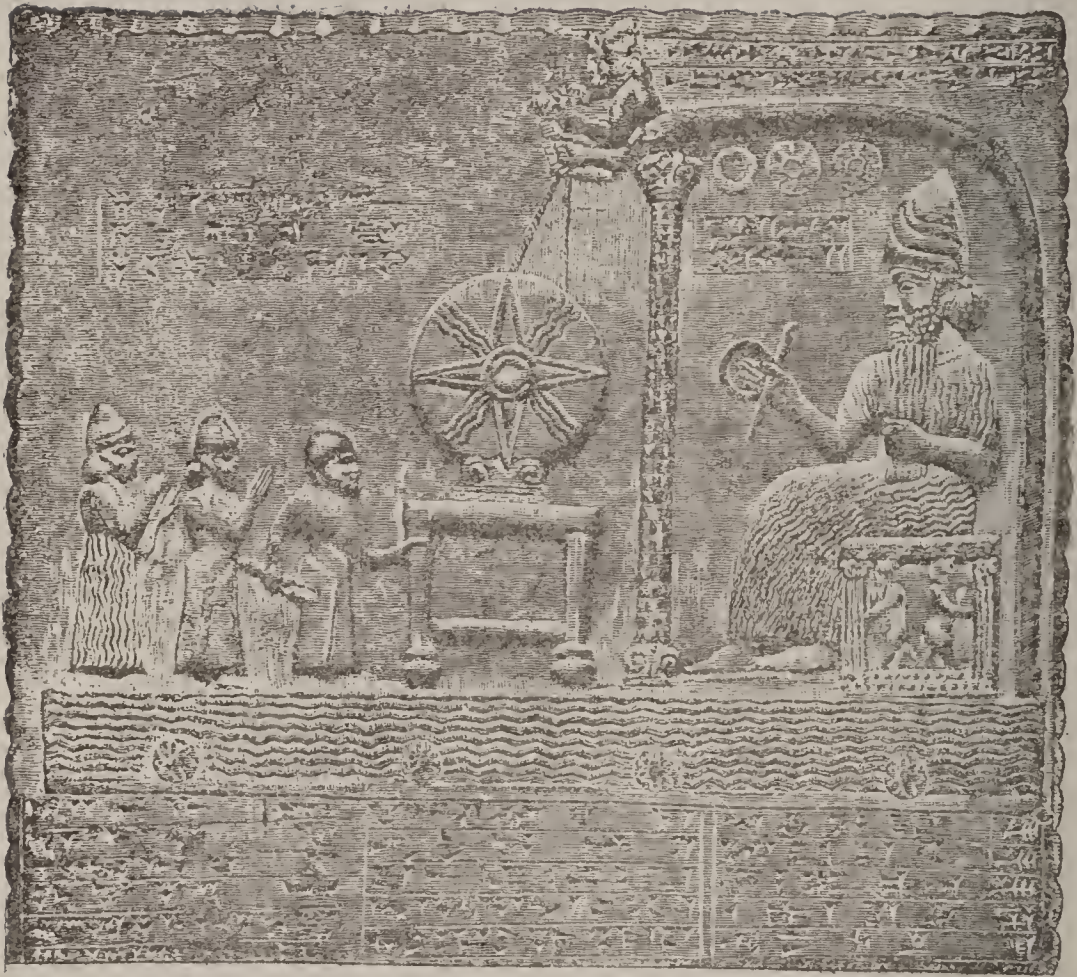
BABYLONIAN—BABYLONIAN CAPTIVITY.

ered a series of tablets called the 'books of spells relating to diseases of the head'—a collection which, according to Lenormant, bears close resemblance to the Atharvaveda (Black Veda) of the Hindus. A Babylonian collection of hymns to the gods has been compared by the same author to the Rig-Veda; in expression and feeling these hymns strikingly resemble the Hebrew psalms. Thus one of the hymns has these verses: 'My god, my creator, take thou mine hands. Guide thou the breath of my mouth; guide thou mine hands; O lord of light.' Another has: 'In heaven, who is high? Thou alone, thou art high. In earth, who is high? Thou alone, thou art high. As for thee, thy word in heaven is declared; the gods bow their faces to the ground. As for thee, thy word in earth is declared; the spirits of earth kiss the ground.' Or: 'O Lord, my transgressions are many: great are my sins. The lord in the anger of his heart hath confounded me.' We possess intact two of the mythological poems that constituted the great epic (in 12 books) of Gizdhubar. In one of the two (the 11th lay or book of the epic) is told the story of the Deluge, agreeing with the Mosaic narrative not only in details, but even in phraseology. The Noah of this version is Tam-zi, 'the son of life;' his ark rests on a mountain in Nisir, s.w. from Lake Urumiyeh. The other poem (6th of the 12 lays of the epic) describes the descent of the goddess Istar into Hades in pursuit of her dead husband Du-zi (the Babylonian Adonis). We have fragments of other lays that recall the Biblical narratives of the tower of Babel, the creation, the fall, sacrifice of Isaac, etc. Of poems not belonging to the epic by far the most remarkable as a work of poetic art is one that tells of the war in heaven between Merodach, champion of the gods, and the demon Tiamat.

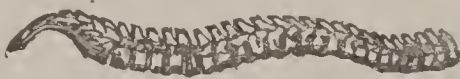
See Rich's *Memoirs on the Ruins of Babylon*, and his *Personal Narrative of a Journey to England by Bussorah, Bagdad, the Ruins of Babylon*; Rawlinson's *Five Great Monarchies*; Layard's *Nineveh and Babylon*; Lenormant's *Langue Primitive de la Chaldée*; *Transactions of the Society of Biblical Archaeology*; Smith's *Assyrian Discoveries*; Sayce's *Babylonia*, in *Encyc. Brit.*; Pinches' *Guide to the Nimroud Central Saloon*, *Brit. Museum*; *Transactions of the Society of Biblical Archaeology*; *Babylonian and Oriental Record*, begun 1886).

BABYLONIAN, a. *bāb'ī-lō'nī-ān*, BAB'YLO'NISH, a., or BABYLONIC, a. *bāb'ī-lōn'ik*, of or relating to Babylon; mixed or confused. BAB'YLO'NISH, a., in *fig. lang.*, outlandish; barbaric; ostentatiously grand, but in bad taste, Babel-like, marked by confusion of tongues: (often improperly used for Babylonian).

BABYLONIAN CAPTIVITY, *bāb-ī-lō'nī-ān*: the transfer of the tribe of Judah to Babylon, after the capture of Jerusalem by King Nebuchadnezzar. In the despotic policy of the East in ancient times, it was a rule to remove the rich and leading inhabitants of a conquered province to



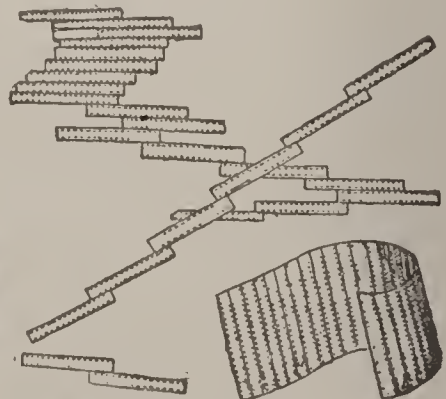
Babylon.—Upper half of 'Sun-god Tablet'—Priests and King adoring the Sun's disk. (British Museum.)



Backbone.—Vertebral Column of Man.



Skull of Babyrroussa.



Bacillaria (magnified 100 diameters).

BABYLONICS—BABYROUSSA.

a distant part of the empire, where they were separated by nationality, language, customs, and religion from the great body of the population, and thus rendered politically harmless; while the people that remained behind were deprived of leaders. The inhabitants of Judea underwent oftener than once a deportation of this kind, after they came into conflict with the powerful kingdom of Assyria. Thus, the kingdom of Israel was destroyed under King Hosea (B.C. 722), by the Assyrian monarch Salmanassar, who, after taking the capital, Samaria, carried the principal inhabitants into captivity in Assyria, and brought stranger tribes into the land of Israel in their stead; these, with the Israelites that remained, formed afterwards the mixed nation of the Samaritans. The most remarkable exile, however, befell the tribe of Judah under Nebuchadnezzar, and consisted of two deportations, B.C. 598 and 588. Zedekiah, King of Judah, warned in vain by the prophet Jeremiah, allied himself with the king of Egypt against the sovereignty of Babylon. Nebuchadnezzar soon appeared with a powerful army before Jerusalem, which he took (B.C. 588). He put out King Zedekiah's eyes, and carried him and the principal inhabitants captive to Babylon. It is this Captivity, the duration of which is usually reckoned at 70 years, though that number is only approximate, that is called, by way of distinction, 'the Babylonian Captivity.' The situation of the exiles was in other respects tolerable. Most of them settled down and acquired property, and even riches: many were called to court, and even raised to high offices in the state. They were allowed to retain their organization by families, and lived by themselves essentially according to the Mosaic law. They had also their own chief, and were allowed the free exercise of their religion. Nor did they want consolation and encouragement; for Ezekiel raised among them his powerful prophetic voice, and the idea of the Messiah became more clearly developed. When Cyrus overthrew the Babylonian empire (B.C. 538), he allowed the Jews to return to their own country. Only the tribes of Judah, Benjamin, and Levi availed themselves of the permission, the other ten tribes disappear from history after the Captivity. It is probable that they had become so mingled with the Babylonians, a people of kindred origin, that they had lost attachment to the country of their race. Vain attempts have, in recent times, been made to discover the ten lost tribes. Some learned men have sought for them in China and India, while some have declared the Afghans to be their descendants, others the North American Indians; and a few have even thought them to be the Anglo-Saxons. One of the more probable conjectures, perhaps, is, that they were the ancestors of the Nestorians in the mountains of Kurdistan.

BABYLONICS, *n. pl. bāb'-ī-lōn'īks*: English designation generally given to a valuable fragment of universal history prior to B.C. 267, composed by Berosus, a priest of Babylon.

BABYROUSSA, or BABIROUSSA, *n. bāb'ī-rōs'-ū* [Malay, *bābi*, a hog; *rūsa*, deer], (*Sus Babirussa*): species of Hog

BACCA—BACCALAUREATE.

(q.v.) inhabiting the forests of Java and the Molucca Islands, remarkable for the extraordinary tusks of the upper jaw, which rise like horns through the bone and integuments.



Babyroussa (*Babirussa alfurus*).

are long, somewhat slender, and curved backwards, their use being probably similar to that of horns. The animal is sometimes called the Horned Hog. Its limbs are much more slender than those of the common hog.

BACCA, n. *băk'ka* [L.]: a berry; in *bot.*, during the time before Linnæus, a berry; any fleshy fruit; *now* (*more precisely*), a many-celled, many-seeded, indehiscent pulpy fruit, in which at maturity the seeds lose their attachment, and become scattered throughout the pulp. BACCA-SICCA, n. *băk'ka-sîk'ka* [L.—*lit.*, a dry berry]: in Prof. Link's arrangement, a fruit which, when unripe is fleshy, but which when ripe becomes dry, when it is distinguishable from a capsule only by not being brown. BACCATE, a. *băk'kât* [L. *baccātus*, furnished with berries—from *bacca*, a berry]: resembling berries. BACCATED, a. *băk'kâ-têd*, having many berries; in *Johnson*, set with pearls. BACCIFEROUS, a. *băk-sîf'êr-ûs* [L. *fero*, I produce], producing berries. BACCIVOROUS, a. *băk-sîv'ô-rûs* [L. *voro*, I devour]: berry-eating.

BACCALAUREATE, n. *băk-ka-law'rê ât* [mid. L. *baccalaureus*. The general opinion is that *baccalaureate* is compounded of L. *bacca*, a berry; *laureatus*, crowned with laurel—from *laurea*, the laurel or bay tree; the reason, according to Calepinus, being—on doubtful historical authority—that students, on gaining the B.A. degree, were crowned with a garland of laurel or bay berries. In L. Lat. *baccalarus*, the original word from which *baccalaureus* may have sprung, was unconnected with *bacca*, a berry, and signified a tenant of a kind of farm in the south of France and the north of Spain called *baccalaria*. Such tenants were bound to give a certain amount of labor to their feudal lord. Wedgwood thinks the word may have had a Basque origin]: in *univ.*, the degree of Bachelor of Arts. BACCALAUREATE SERMON, n., in American colleges a farewell sermon, preached to students on the Sunday preceding their day of graduation. BACCALAUREUS, n. *băk-ka-law'rê-ûs*, one who has taken the first degree in a university; a Bachelor of Arts. See BACHELOR.

BACCARAT—BACCHIUS.

BACCARAT, *băk-ka-ră'* [F., etymology unknown]: game of cards played by any number of betters and a banker, with one or more packs of cards: it is the game of cards most usual in France. As a game of pure chance it is, outside of France at least, a 'gambler's game,' and in England it is treated as 'unlawful.' At B a stake is laid by each better, and the banker duplicates all stakes, dealing then to each player and himself 2 cards. The question is to decide each individual bet by comparing the total count of each better with the count held by the banker. When a player's count is 9 he declares it, and then all of the betters who hold hands superior to the banker's win their bets, and the banker takes the stakes of the rest.

BACCHA, n. *băk'ka* [Gr. *Bakche*, a mythological name]: genus of dipterous insects belonging to the family *Syrphidæ*.

BACCHANAL, n. *băk'kă-năl*, or **BACCHANALIAN**, n. *băk'kă-nă lî-ăn* [L. *bacchanālis*, devoted to Bacchus—from *Bacchus*, the heathen god placed over drinking and feasting]: one who indulges to excess in intoxicating drinks; one engaged in noisy and drunken revels: **ADJ.** riotous; pertaining to revelling and drinking. **BAC'CHANALS**, n. plu. *-nălz*, or **BAC'CHANA'LIA**, n. plu. *-nă lî-ă*, drunken feasts; ancient feasts in honor of Bacchus; seasons of frightful indecency and excess; sometimes called Dionysia. See **BACCHUS**. **BACCHIC**, a. *băk'kîk*, jovial; drunken. **BACCHANT**, n. *băk kănt'*, one in a state of drunken frenzy. **BACCHANTE**, n. fem. *băk kănt'*, a priestess or female votary of Bacchus. **BACCHANTES**, n. plu. *băk-kănt'êz*, the persons, chiefly women, who took part in the festivals of Bacchus.

BACCHARIDEÆ, n. plu. *băk-ka-rîd'ê-ê*: a family of shrubs and herbs belonging to the order *Compositæ*, first sub-order *Tubulifloræ*, and the third tribe *Asteroideæ*. **BACCHARIS**, n. *băk'ka-rîs* [Gr. *bakkaris*—from the Lydian language; a plant yielding oil]: Plowman's spikenard. Genus of *baccharidææ*. Above 200 species are known, all of which belong to the w. hemisphere. They are herbs, shrubs, and sometimes small trees, many of them resinous and glossy. *B. microcephala* is used in Parana for curing rheumatism, and *B. genistilloides* in Brazil in intermittent fever.

BACCHIGLIONÉ, *băk-kêl-yô'nă*: a river of n. Italy, having its source in the Alps, and its outlet in the Adriatic. It passes through the town of Vicenza, where it is crossed by a fine bridge of nine arches; flows through the plain of Padua, and enters the Adriatic about 3 m. s. of Chioggia. Its whole course is about 90 m., and it is navigable by large boats from Vicenza to the sea.

BACCHIUS, n. *băk-kî'ûs* [L. *bacchius*—from Gr. *bakcheios*]: in *pros.*, a foot consisting of three syllables, the first and second long, and the third short, as *pē | jō | ră*; or, according to others, the first short and the second and third long, as *că | rî | năs*.

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BACCHUS, *băk'kûs*: the god of wine (called in Greek *Bakchos*, *Dionysos*, and also, especially in the Mysteries, *Iakchos*); son of Zeus and Semele, the daughter of Cadmus. Before his birth, Semele fell a victim to the insidious counsels of the jealous Here, who induced her to petition Zeus to visit her in his proper form and majesty—i. e., attended with thunder and lightning. The mother was of course consumed, but the six-months'-old B. was saved by being enclosed for some time in the thigh of Zeus. He was first consigned to the care of Ino, the sister of Semele, and her husband Athamas, but when Ino and Athamas were driven mad by Here, Zeus caused him to be carried to Nysa, in Thrace, and then given in charge to the Nymphs. It was here that B. taught the cultivation of the vine, and prepared intoxicating drink from the grapes. In order to impart his discovery to mankind, or, as some say, because Here smote him with madness, he wandered through many countries attended by the Nymphs, who were crowned with



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ivy and vine-leaves, and bore in their hands the *thyrsus*, a pole bound round with leaves and fruit. This expedition, according to a later form of the myth, extended to Bactria and Media, to Egypt and India, where B. is said to have erected pillars as the eastern boundary of the world. Wherever he came in his wide progress, there is a Nysa to be found. The worship of the god, which came originally from the East, and was introduced into Greece by Melampus, was thus spread over nearly the whole known earth, and at the same time the myth of B. was variously modified among the different peoples, so that it has become one of the most perplexed and difficult. B. was, besides, the protector of fruit trees and fruits. The god naturally received many surnames; for instance, *Lenæos*, from the wine-vat (*lenos*); *Bromius*, from shouting (*bromos*); *Euios* (in Latin, *Euius*), from the exclamation *huoi*, etc. The mythical march or expedition, above spoken of, was suggested to the fancy by the Bacchanalian festivals, at which Bacchantes roved about in feigned madness, and made midnight processions to the mountains by torchlight. The legend was, that B. met with

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much opposition on his expeditions, many refusing to acknowledge his divinity. Thus, Lycurgus, King of the Edones, opposed him, and Pentheus of Thebes, who was on that account torn to pieces by his own mother and her sisters. The daughters of Mynias (q.v.), who refused to celebrate his festivals, were punished by him with madness and metamorphosis. As he was crossing to Naxos, the Tyrrhenian sailors wished to carry him off to Italy, and, with this view, bound him; but the chains fell off, vines and ivy entwined the ship, and held it fast in the middle of the sea. B. changed himself into a lion, and the sailors from terror leaped into the sea, where they were transformed into dolphins. Those, on the contrary, who received him with hospitality and reverence were rewarded; such as Midas (q.v.). In general, the character of B. is mild. In works of art, his type is that of a youth inclining to effeminacy. His peculiar ornament is the fillet. The long blond hair is bound up in a knot behind, and only a few locks fall down on both sides over the shoulders; the hair is surrounded by a twig of vine or of ivy. His figure is neither stout nor slim. He is usually represented quite naked; sometimes with a wide robe negligently thrown over, which either covers a part of the shoulders and thighs, or, though more rarely, enwraps the greater part of the body. Frequently, a deer-skin hangs across the breast; at times, he wears shoes, more rarely buskins. From this, the properly Grecian B., the bearded or Indian B. is completely distinct. This last appears in a more dignified, lofty, regal form; he is clad in a tunic reaching to the feet, over which he wears a wide and splendid mantle. As a warrior he wears a short tunic girdled round the waist, with buskins on the feet; a panther's skin serves him for a shield. In addition, he is to be seen at times with horns. After the institution of the Eleusinian Mysteries, the service of B. was conjoined with these; accordingly Pindar makes him the companion of Demeter. As the followers of Orpheus held him to be also Apollo, he is associated with the Delphic oracle.

The worship of B. consisted in noisy rites. Thebes, in Bæotia, held to be the birthplace of the god, was considered the chief seat of those rites in Greece. In Athens, the worship of the Lenæan B. was the most ancient, and may be traced back to ante-historic times. The chief offerings made to him were goats and oxen; the last, because he himself was conceived and represented under the form of an ox. The Bacchic festivals deserving special notice are—1. The Attic Dionysia, of which the minor, or country Dionysia, were celebrated in the country in the month Poseideon, at the time of the grape-gathering. Among the characteristic amusements of the occasion were the Askolia, which consisted in smearing full wine-skins (*askoi*) with oil, on which the young peasants attempted to leap with one foot, and by their frequent falls produced merriment. There were also dramatic entertainments. This festival was held probably at the approach of the wine-harvest, and that of the Haloa at its close. These were followed, in the month Gamelion, by the festival of the Lenæa, peculiar to the city of Athens.

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The festivities on the occasion, besides theatrical representations, consisted in a great banquet, for which the state provided the meat, and in a procession through the city, attended with the jesting and raillery usual at Bacchic ceremonies. After the Lenæa came the Anthesteria, on the 11th, 12th, and 13th of the month Anthesterion, when the new wine was first drunk. On the second day of this festival, the chief solemnity consisted in a great public dinner, at which the guests, crowned with flowers, and to the music of trumpets, entered into regular contests in drinking, and in a private sacrifice for the prosperity of the state offered by the 'king's archon's' wife, who was at the same time symbolically married to the god. On the third day, a sacrifice was offered to the Clithonian Hermes and to the souls of the dead. Last came the Great Dionysia, celebrated in the month Elaphebolion, and at which new come-



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dies and tragedies were represented. 2. The Triateric Dionysia, which was celebrated every third year in the middle of winter. The performers were women and girls (called in Greek, *Mænades*; in Latin, *Bacchæ* or *Bacchantes*), and the orgies were held at night, on the mountains, with blazing torches and the wildest enthusiasm. This mystic solemnity came from Thrace, and its institution is referred to Orpheus. When it was adopted in Greece cannot be exactly determined. It is earliest met with in Bæotia, particularly at Thebes, where the Cithæron was the scene of celebration. An important place in connection with it is also Parnassus, on the highest summit of which the women of Attica and Delphi celebrated nocturnal orgies in honor of B. and Apollo. The Mænades or Bacchantes were clad on the occasion in fawn-skins, swung about the 'thyrsus,' made a great noise with clapping of hands, and danced

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wildly with streaming hair. In this ecstatic solemnity, the god himself was represented by the victim sacred to him, the ox, which the Mænades in their fury tore to pieces. In the most ancient times, even human sacrifices were not uncommon. Descriptions of these wild and terrible rites are not unfrequent in the poets. 3. The Bacchanalia of later times, the foundation of which was laid in Athens, during the Peloponnesian war, by the introduction of foreign rites. From Greece they were carried to Italy. As early as B.C. 496, the Greek worship of B. was introduced at Rome with that of Ceres; and Ceres, Liber, and Libera were worshipped in a common temple. In honor of these deities, the Liber-
alia were celebrated, March 17, and were of a yet simpler and ruder kind than the great Dionysia of Athens. Afterwards, however, these rites degenerated, and came to be celebrated with a licentiousness that threatened the destruction of public morality and society itself. They were made the occasion of the most unnatural excesses. At first, only women took part in these mysterious Bacchic rites, but latterly men were also admitted. When the evil had reached its greatest height, the government (B.C. 186) instituted an inquiry into it, and rooted out the Bacchanalia with the greatest severity. This was the occasion of the well-known *Senatûs Consultum de Bacchanalibus*. Mention of them, however, occurs at a later period under the emperors.

BACCIO DELLA PORTA, *bât'cho dël-lâ pør'tá* (better known by the name of Fra Bartolommeo di San Marco): 1469–1517; b. Savignano, Tuscany: one of the most distinguished masters of the Florentine school of painting. His first teacher was Cosimo Roselli; but he owed his higher cultivation to the study of the works of Leonardo da Vinci. His subject are mostly religious, and by far the greater part of his pieces belong to the latter years of his life. He was a warm adherent of that bold reformer of church and state, Savonarola (q.v.), after whose tragical end he, 1500, took the habit of the cloister, and for a considerable time renounced art. The visit of the young Raphael to Florence, 1504, seems to have been instrumental in stimulating him to return to art. He imparted to Raphael his knowledge of coloring, and acquired from him a more perfect knowledge of perspective. The two remained constant friends—B., on one occasion, finishing certain of Raphael's unfinished works, Raphael performing a like kindness for him at another time. B. died at Florence. The greater number of his works are at Florence, in the gallery of the Pitti Palace.

BACH, *bák*, Baron ALEXANDER: Austrian statesman; born 1813, Jan. 4, at Loosdorf, Lower Austria, where his father held a judicial office. At the age of 24, he entered the imperial service, and during nine years travelled over Europe and in Asia. He was on terms of friendship with the members of the opposition of Lower Austria, and belonged to that circle of young men who understood the failings of the old Austrian system, and the inevitability of a change. At the revolutionary period, 1848, March,

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B. acted as mediator. He formed part of the Provisional Committee of the Commons, and was chosen in April, by the states of Lower Austria, one of their representatives in the Central Commission of the Provincial States of Austria.

In his political career, from the outset, B. advocated the centralization of the Austrian monarchy, and opposed the independence of Hungary, as well as the entry of the German provinces of Austria into the German confederation. But he desired an extension of the basis of the states, and of their parliamentary influence in the direction of public affairs. During the occurrences of 1848, May 15, B. kept away from Vienna; but when the old liberal opposition came to the helm, B. undertook the ministry of justice, entering with energy into the remodelling of the system of Austrian law. His course incurred the hatred of the 'left,' and of the democratic party generally; and he was bitterly opposed in his advocacy of the principle of compensation in the removal of the burdens of peasant proprietors, and in his policy regarding Hungary. In the events of 1848, Oct. 6, B. would have fallen a victim to popular fury, like the war-minister Latour, had he not withdrawn from pursuit. On the formation of the Schwartzemberg-Stadion ministry, he again took the portfolio of justice, and on the withdrawal of Stadion, 1849, May, B. took his place at the head of the ministry of the interior; from which he was sent, 1859, as plenipotentiary to Rome—a mission which ended 1865.

BACH, JOHANN SEBASTIAN: celebrated musician: 1685, March 21--1750, Jul. 28; b. Eisenach, Upper Saxony. At the age of nine he lost his father, the 'town-musician' of Eisenach, and sought the protection of an elder brother, on whose death in 1698 B. was again left destitute, and, to earn a livelihood, entered the choir of St. Michael's, Lüneburg, as a soprano singer. In 1703, he became court-musician at Weimar, in 1704 organist at Arnstadt, in 1707 at Mühlhausen. His reputation in this capacity soon spread, and in 1708 he was appointed court-organist at Weimar, by the reigning duke. While holding this office, he labored assiduously to make himself master of every branch of music. In 1717, he was made director of concerts, and six years afterwards director of music, and cantor to St. Thomas's School, Leipsic, an appointment which he held to his death. About ten years later, the honorary distinctions of Kapellmeister to the Duke of Weissenfels, and court composer to the King of Poland, were conferred upon him. B.'s close studies affected his eyes, and an operation designed to benefit them left him totally blind, and hastened his death. With the exception of Handel, B. had no rival as an organist; and his compositions for the organ have a high reputation. They are too elaborate, however, to be popular, though his fame as a composer is sure to advance with scientific musical culture, bringing capacity to appreciate the grandeur of some of his works.

Four sons also were musicians of some note: Wilhelm Friedmann, eldest son, 1710-84; Karl Philipp Emanuel,



BACH.

A. D. 1685-1750.

FOUNDER OF MODERN MUSIC.

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second son, 1714-88; Johann Christoph Friedrich, tenth son, 1732-95; Johann Christian, 1735-82. There are good lives by Hilgenfeld (1850), Bilter (1865; 2d ed. 1881), and Spitta (2 vols. 1873-80).

BACHARACH, *bâ-kâ-râk*: small town of Rhenish Prussia, on the left bank of the Rhine; 22½m. above Coblenz; with considerable commerce by river-craft. It is said to have derived its name from Bacchus (*Bacchiaræ*), and the vine is still largely cultivated in the neighborhood—producing superior wine. B. is noteworthy as the place where Blücher crossed the Rhine, 1814, Jan 1. Pop. abt. 1,900.

BACHE, *bâch*, ALEXANDER DALLAS, LL.D.: scientist and educator: 1806, July 19—1867, Feb. 17; b. Philadelphia. He graduated with highest honors from West Point 1825, was asst. prof. in that institution 1826, and was appointed prof. of nat. philosophy and chemistry in the Univ. of Pennsylvania 1828. During this period, he made important scientific investigations, and was a prominent member of the Franklin Institute and of the Amer. Philos. Soc. He was selected to organize and was the first pres. of Girard College 1836; investigated the educational methods of Europe, and 1839 made a valuable report thereon. For some time he was connected with the schools of Philadelphia, and greatly improved the system of education. Under the auspices of the Amer. Philos. Soc., he opened, and for some years managed, a magnetical and meteorological observatory. He was again prof. at the Univ. of Pennsylvania 1842-3, and from the latter year till his death was supt. of the govt. Coast Survey, in which field he labored with great zeal and efficiency. He was vice-pres. of the Sanitary Commission in the civil war, was for many years an efficient regent of the Smithsonian Institution, was the first pres. of the National Acad. of Sciences, and an honorary member of numerous scientific societies in Europe. He published a large number of scientific papers, and *Observations at the Magnetic and Meteorological Observatory at the Girard College*, 3 vols. All his property was left to the National Acad. of Sciences to promote physical research. He died at Newport, R. I.

BACHE, BENJAMIN FRANKLIN, M.D.: surgeon: 1801, Feb. 7—1881, Nov. 2; b. Monticello, Va.; great-grandson of Benjamin Franklin. He graduated from Princeton 1819, studied medicine at the Univ. of Pennsylvania, became asst. surgeon in the navy 1824, and surgeon 1828. While on leave of absence 1838-41, he was prof. in Kenyon College, O.; was several years with govt. fleets in foreign waters; and 1853-71 was supt. of a laboratory at the Naval Hospital in New York for furnishing medicines to the navy, from which he retired with the rank of commodore. He died at New York.

BACHE, RICHARD: 1737, Sep. 12—1811, July 29; b. England. He came to this country, married the only daughter of Benjamin Franklin 1767, became an insur-

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ance agent in Philadelphia 1770, was financially successful, held various offices, and was postmaster-general 1776–82. He died in Berks co., Penn.

BACHE, SARAH (FRANKLIN): 1744, Sep. 11—1808, Oct. 5; wife of Richard B. and daughter of Dr. Franklin. She was well educated, and was noted for her skill in domestic affairs, and for the energy and efficiency with which she organized and managed a movement for relief of the suffering soldiers in the revolution. She directed the work of more than 2,000 women who were making garments, collected articles needed for the sick, and was a nurse in the soldiers' hospitals.

BACHELOR, n. *băch'ě-lér* [OF. *bachelier*, a lad: mid. L. *baccalārĭŭs*, a cow-herd, a lad over sixteen years—from mid. L. *bacca* for *vacca*, a cow: arbitrarily changed by university clerks at close of middle ages to *baccalau'rĕŭs*—*lit.*, a cow-herd, or one who cultivated certain parts of church lands]: an unmarried man of any age; one who has taken the first degree in arts in a college or university—abbreviated B.A.; in *divinity*, the first degree is B.D.; in *law*, LL.B.; in *medicine*, M.B.; in *music*, MUS. BAC. BACH'ELORSHIP, n. condition of a bachelor; or BACH'ELORISM, n. KNIGHT-BACHELOR, a knight of the lowest order; a knight belonging to no order; a young knight. This lowest grade of knighthood is now conferred only in the United Kingdom. Originally, like all knighthood, a military distinction, knighthood of this description came to be bestowed often on civilians, and in recent times it has been conferred frequently for no weightier service than carrying a congratulatory address to court. It is generally conferred by the sovereign by a verbal declaration accompanied with the imposition of the sword, and without any patent or instrument. The person who is to receive the honor kneels down before the sovereign, who touches him on the shoulder with a naked sword, saying, in French: '*Sois chevalier au nom de Dieu*' (Be a knight in God's name), and then adds: 'Rise, Sir A.B.' In exceptional cases, persons have been made Knights Bachelor by patent. See KNIGHT.

BACHELOR, *băch'ě-lér* [Lat. *baccalaureus*, or as it is variously written in old documents, *baccalareus*, *bacularius*, and *bacillarius*]. This word, which first makes its appearance in middle-age Latin, was long regarded as of uncertain etymology. The old derivation, from *bacca laurea*, a laurel berry, certainly gives us little help; but the Spanish *bachillir*, which means at once a *babbler* and a master of arts, taken in conjunction with the Portuguese *bacharel* and *bacillo*, a shoot or twig of the vine (from the Latin *baculus* or *baculum*, a stick or shoot), were thought likely by some. Brachet, however, affirms that the word is derived from the Low Latin *baccalarius*, a farm-servant, originally a cow-herd; and this plainly comes from *bacca*, Low Latin for *vacca*, a cow. Odd though it seem, this will connect fairly with the special meanings of the word given by Ducange. 1. It was used, he says, to indicate a person who cultivated certain portions of church-lands called *bac-*

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calaria—which he supposes to have been a corruption of *vassalaria*—a feu belonging to an inferior vassal, or to one who had not attained to a full feudal recognition. 2. It indicated ecclesiastics of a lower dignity than the other members of a religious brotherhood—i.e., monks who were still in the first stages of monkhood. 3. It was used by later writers to indicate persons in the first or probationary stage of knighthood; i.e., not esquires simply, but knights who, from poverty and the insufficient number of their retainers—from their possessing, perhaps, only the *baccalaria* above referred to—or from nonage, had not yet raised their banner in the field (*levé bannière*). 4. It was adopted to indicate the first grade or step in the career of university life. As an academical title, it was introduced by Pope Gregory IX., 13th c., into the Univ. of Paris, to denote a candidate who had undergone his first academical trials, and was authorized to give lectures, but was not yet admitted to the rank of an independent master or doctor. At a later period, it was introduced into the other faculties as the lowest academical honor, and adopted by the other universities of Europe. See DEGREE (in Univ.): UNIVERSITY. 5. It came to be used in its popular meaning of an unmarried man, who was thus regarded as a candidate or probationer for matrimony.

The legislation of almost every country, at some period of its history, has imposed penalties on male celibates or bachelors, on the principle that every citizen is bound to rear up legitimate children to the state. By the Jews, the command, 'Be fruitful and multiply,' was interpreted strictly, and every Hebrew regarded marriage as a duty. In Sparta, where the interests of the individual were sunk in those of the state, criminal proceedings were authorized by the laws of Lycurgus not only against those who neglected to marry, but against those who, from marrying late in life, or any other cause, formed such alliances as rendered the procreation of healthy children unlikely. By the laws of Solon, celibacy was treated as a crime, though the practice of interfering with the feelings of the individual in this respect early fell into disuse at Athens. At Rome, penalties and disabilities were imposed on unmarried men from an early period, and latterly on unmarried women also. In the allotment of the Campanian lands, Julius Cæsar gave portions only to those who had three or more children. The most important provisions on this subject are in the law (or rather the laws, for it consisted of an act and an amended act) called *Lex Julia et Papia Poppæa*, the first portion of which belongs probably to B.C. 18, and the second portion to A.D. 9. In addition to various other provisions regarding marriage, this law imposed penalties on those who lived in a state of celibacy after a certain age. No unmarried person could take a legacy, whether of a portion or of the whole possessions of a deceased person, unless he complied with the law—i.e., married within a hundred days from the testator's death. Widows were at first allowed a year from their husband's death, and divorced women six months from the time of

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the divorce, before they came within the penalties of the law; and these periods were afterwards extended to two years, and a year and six months, respectively. The original provisions of the law did not apply to men beyond sixty, or woman above fifty, but they were extended to them by subsequent enactments. Childless married persons, moreover, from the ages of twenty-five to sixty in males, and twenty to fifty in females, were subject to the penalties of the *lex*, to the extent of losing one-half of any inheritance or legacy which might be bequeathed to them.

In Britain, there are numerous instances of additional or higher taxes being imposed on bachelors and widowers, but apparently more with a view to the revenue than with any other object. Of this, an instance is an act passed 1695, granting to the king certain duties on marriages, births, and burials, and on bachelors and widowers for five years, 'for carrying on the war against France with vigor.' See CELIBACY: MARRIAGE: VITAL STATISTICS.

BACHIAN, *bâ-chê-ân'*: island in the E. Indies, one of the group of Moluccas, s. of the equator. There are two elevated portions, connected by an isthmus, but little above the ocean level. The area, estimated about 900 sq. m., is largely covered with fine trees. The inhabitants reside on the coast and represent various races. The local ruler is under the authority of the Dutch. Coal and other minerals are found, and there are several hot springs. Among products of the island are coconuts, sago, and cloves. Many nutmeg-trees still resist the efforts of the Dutch for their extermination. The principal town is Amassing, sometimes called B., and is on the isthmus.

BACILLARIA, n. *bās-īl-lā'rī-a* [L. *bacillus*]: genus of diatomaceous Algæ: see DIATOMACEÆ. They consist of rectangular, rod-like segments, arranged either diagonally or in tabular form. The segments are continually in motion, slipping over one another, forward and backward, after the manner of a carpenter's plane.

BACILLUS, n. *bă-sīl'lūs*, BACIL'LI, n. plu. *-lī* [L. *bacillus*, dim. of *baculus*, rod]: one of the genera of the bacteria. The bacilli are rod-shaped and may or may not possess flagella. Many of them are motile, and a large number form spores. They are among the most numerous of the bacteria and vary greatly in size and shape. Some, like the *B. prodigiosus*, which forms a brilliant red pigment, are very short and can be mistaken for cocci, while others, like the *B. anthracis*, are much longer and larger, and when growing in chains are almost visible to the naked eye.

Some of the most important disease-producing bacteria belong to this genus. *Bacillus typhosus* is the cause of typhoid fever. *B. coli-communis*, which is always found in the healthy intestinal tract, can at times cause inflammation in the appendix and thus produce an attack of appendicitis. *B. lepræ* is the cause of leprosy. *B. diphtheriæ* produces diphtheria. As this organism grows very readily

BACIOCCHI—BACK.

in milk, diphtheria can readily be conveyed from one child to another through this means. *B. tetanæ* is the cause of tetanus, popularly spoken of as lockjaw. This *B.* lives in the earth, and the disease originates generally from deep punctured wounds which in some manner have become infected from earth containing the micro-organisms.

One *B.* is more important than all others. It causes the death of one out of every seven of the population of the globe. It is the *B. tuberculosis*, first definitely isolated and studied by Dr. Robert Koch, the German bacteriologist. It is a short delicate rod-like organism which grows only at about the temperature of the body. As a result of its life-activity it develops certain poisons which cause tuberculosis in its many forms, such as consumption, which is tuberculosis of the lungs, and hump-back which is usually tuberculosis of the spinal column. Hip-joint disease, water on the brain, tubercular meningitis of young children, marasmus, white swellings, and lupus, all are caused by this *B.* The greatest source of infection is by means of the sputum of persons afflicted with pulmonary consumption. If this sputum could always be destroyed the disease would spread less rapidly. Another important avenue of infection is through the milk of tuberculous cows. These animals are very often diseased, especially those living near a large city, and from their milk the disease can be communicated. This is now recognized as a frequent source of infection in young children.—See BACTERIA: GERM THEORY.

BACIOCCHI, *bât-cho'kê*, MARIE-ANNE-ELISA BONAPARTE, eldest sister of Napoleon Bonaparte: 1777–1820; b. Ajaccio, Corsica. When that island was occupied by the English, she, with her family, emigrated to Marseille, where she married, at the age of 20, a countryman of her own, Captain Baciocchi. The elevation of Napoleon raised her also to rank and power; and 1806. the principality of Massa and Carrara was intrusted to her administration, which was, on the whole, beneficial for the people. In 1809, she was made Grand Duchess of Tuscany, and appointed as administrator over that country in Napoleon's name. Here the arbitrary measures of her brother, which she had to carry out, and her own self-will and harshness, rendered her unpopular. Her husband took no part in the government. When the allies entered Tuscany, 1814, she had to leave Florence. She died, at Bologna, of nervous fever.

BACK, n. *bāk* [Icel. *bak*: Pol. *opak*, the wrong way. Fin. *paha*, bad]: the part of the body turned away from the face; the upper part in animals, and the hinder part in man; the rear; the part out of sight; a miner's term for joints; that part of a mineral lode nearest the surface: ADJ. that is situated behind; previous: V. to mount; to support; to put or move back: AD. to the place from whence one came; to a former state or condition; behind; not advancing again. BACK'ING, imp. BACKED, *bākt*, pp: ADJ. having a back. BACKER, n. *bāk'ér*, one who supports

BACK.

another in a contest. **BACKS AND CUTTERS**, applied to a jointed structure in rocks—the *backs* running in lines less or more parallel to the strike of the strata, the *cutters* crossing these, generally at right angles. **BACKS**, n. plu. among *leather-dealers*, the leather selected from the thickest and stoutest ox-hides. **BACK'BOARD**, n. a board for the support of the back; a board across the stern of a boat for the passengers to lean against; a board attached to the rim of a water-wheel, to prevent the water running off the floats or paddles into the interior of the wheel; a part of a lathe: **ADJ.** behind the ship. **BACK'-CAST**, a., retrospective: **N.** anything which throws one back from a state of prosperity to one of adversity. **BACK'-FILLING**, n. the act or process of restoring to its place, as in the case of a grave, the earth which has been removed; the earth thus restored to its place. **BACKING OF THE WIND**, when the wind appears to shift against the sun's course, being a sign of more wind or bad weather. **BACK-FRIEND**, one who does injury under the cover of friendship. **BACK-MAN**, n. a follower in war; a henchman. **BACK-RENT**, in *Scot.*, rent paid by a tenant after he has reaped the crop, in contradistinction to *fore-rent*, which is paid before the first harvest. **BACKSET**, a. *bāk'sèt*, set upon behind: **N.** [*Scotch set*, a lease]: whatever drives one back in any pursuit; anything which checks vegetation; in *old law*, a sub-lease in which the possession is restored on certain conditions to those who were formerly interested in it, or to some others. **BACK-WATER**, n. water in a stream which, meeting with some impediment in its progress, is thrown backwards; water in a mill-race thrown back by the turning of a water-wheel, or some other cause. **TO BACK A DOCUMENT**, to write the signature on its back; to indorse it. **TO BACK AN ANCHOR**, to let go a small anchor, so that it may lie behind or ahead of a large one, so fastened as to hinder it coming home. **TO BACK ASTERN**, to cause a boat to move stern foremost. **TO BACK OARS**, to move them so as to cause the boat to move stern foremost. **TO BACK AND FILL**, a mode of tacking when the tide is with a vessel, but the wind against her. **TO BACK THE SAILS**, to arrange them so as to make the ship move astern or backwards; it is done when the tide or current is with the ship, and light winds against her; and the maneuver is useful to avoid collisions in narrow channels, to bring the ship into a particular position during naval engagements, or to keep ships well asunder when crowded in convoy. **TO BACK THE MAINTOP-SAIL** (and analogous operations to other sails), to arrange a sail so that the speed of the ship's progress may be checked. **TO BACK OUT**, to withdraw from an engagement or undertaking. **TO BACK UP**, to give friendly and active support to. See under **BACKGROUND**.

BACK, n. *bāk*, or **BAC**, n. *bāk* [*Bret. bac*, a boat: *Dut. back*, a trough: *Dan. bakke*, a tray]: a brewer's vat or large open tub for containing beer; a ferry-boat. **BACKET**, n. *bāk'èt* [from *back*, in the sense of a wide open vessel: *F. baquet*, a tub or pail]: in a *kitchen*, a wooden or iron vessel for carrying coal or ashes.

BACK—BACKERGUNGE.

BACK, n. [Ger. *backen*, to bake]: an instrument for toasting bread above the fire. It is like a griddle but much thicker. **BACK-STONE**, n. the heated stone or iron on which oat-cake is baked.

BACK, Sir **GEORGE**, well-known traveller in the polar regions: 1796–1878, June; b. Stockport, Eng. He accompanied Franklin and Richardson in their expedition to the n. coast of America. He volunteered to the government to go in search of Captain Ross, supposed to have been lost in his attempt to discover the Northwest Passage; and left London, 1833, Feb. 17; and, June 28, started from Norwayhouse, a station of the Hudson Bay company. After a terrible winter with his companions at Slave Lake, he discovered, 1834, Artillery Lake, and the Great Fish river, or Back's river, which he followed to the Frozen Ocean. Being hindered by the ice from proceeding along the coast as far as Cape Turn-again, he returned by the river; but although he had received news of the return of Captain Ross he continued his explorations in the North Sea, and did not return to England until 1835, when he was raised to the rank of post-captain for his services. In 1836, 7 he further explored the arctic shores in the interest of geography. Two years afterwards, he was knighted, and had a lucrative treasury appointment; attained flag rank, 1857; admiral, 1867.

BACKBITE, v. *băk'bit* [see **BACK** 1] to slander; to speak ill of a person behind his back. **BACK-BITING**, imp.: N. the act of slandering the absent. **BACKBITTEN**, pp. *băk'bit'ten*. **BACK-BITER**, n. *-bī-ter*, one who.

BACKBONE, n. *băk'bôn* [see **BACK** 1]: the series of bones, called vertebræ, which enclose the spinal cord of the higher animals, and constitute the spinal column; the vertebral column; the watershed of a district. To **HAVE BACKBONE**, to have firmness and stability of purpose, or moral principle.

BACKDOOR, n. *băk'dôr* [see **BACK** 1]: a back or private passage; an indirect way.

BACKERGUNGE, *băk-ēr-gŭnj*: town of Bengal; on B. creek, an offset from the Ganges; lat. 22° 33' n., long. 90° 22' e.; 125 m. e. of Calcutta. Till supplanted by Burrisol, 12 m. to the n., it was the cap. of the district; it is now in ruins.

BACKERGUNGE; district of Bengal; n. lat. from 22° 2' to 23° 13'; in e. long. from 89° 49' to 91°; 3,649 sq. m. Like the rest of the great delta of Bengal, B. is of alluvial formation and level surface, being watered at once by the lower streams of the Ganges and the Brahmaputra, and by the various branches or offsets which interlace those mighty rivers. In consequence of the great number of water-courses, which at once cool the atmosphere and drain the soil, the country is fertile, and the temperature is said never to rise above 88° in the shade. From the same cause, the district is independent of regular roads for intercourse and communication. In the season of high-

BACKGAMMON.

water, as may be expected, inundations are common. To guard against them, the houses are built on mounds; while the corresponding excavations, like the natural 'water-holes' of Australia, serve as tanks against the effects of the dry season. As in other alluvial regions, land-slips are frequent, also the opening of new channels by the streams. The productions are rice, sugar, cotton, pulse, mustard, cocoa-nut, betel-nut, mango, guava, plaintains, limes, pineapples, ginger, and turmeric. Buffaloes are said to be generally used instead of oxen, of which the domestic breed is small and poor. Pop. (1891) 2,377,433; abt. 480 to a sq. mile.

BACKGAMMON, n. *bǎk-gǎm'mǎn* [Dan. *bakke*, a tray; *gammen*, a game]: a game played with 30 pieces on a table having 24 points, and with use of a box and dice. B. is the modern name of a game of considerable antiquity in England, where it was formerly known by the appellation of 'the tables.' Besides the derivation from the Danish, the words *back-gammon* have been ascribed to the Welsh tongue, in which they are said to signify *little battle*; but Strutt, with greater plausibility, traces the term to the Saxon '*bac* and *gamen*—that is, back-game—so denominated because the performance consists in the two players bringing their men back from their antagonist's tables into their own; or because the pieces are sometimes taken up and obliged to go back—that is, re-enter at the table they came from.'

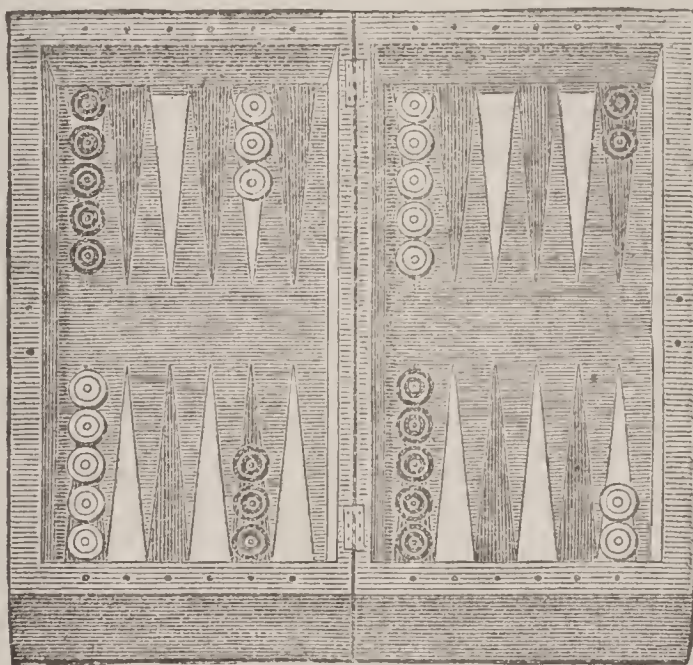
The constant use of dice in determining moves, makes B. essentially a game of chance. The B. board consists of two parts or tables, usually joined by a hinge in the middle, by which they can be shut up as a box. Each table has twelve points, six at each end. These points are colored white and black alternately, merely that the points may be more easily counted. The game is played by two parties, and with 30 pieces or men; each party has 15 men, one set of 15 being black, and the other white. In beginning, the men are placed on certain points, on the tables, as shown in the following figure. The game is played with two dice and two dice-boxes. The dice are common to both; but each party uses his own dice-box, and the throws are alternate. Each die is a perfect cube, marked on its sides with dots from 1 to 6. The 1 is called *ace*; the 2, *deuce*; the 3, *tre* or *trois*; the 4, *quatre*; the 5, *cinque*; and the 6, *size*. At every throw, the two dice are employed; consequently, a person may throw from 2 up to 12—that is, two *aces* up to two *sizes*. If a player throws *doublets*, or both dice of one number, double the number of dots is reckoned; thus, by a throw of two aces, the player does not count 2, but 4. These numbers thrown or accidentally turned up by the dice, bear a reference to the points on the tables. In order to understand this connection between the dice and the men, the learner must observe how the men are placed on the points, and the rules by which their shifting from one to another is governed.

The tables are here spread out as if two players were

BACKGAMMON.

seated, and about to begin. The player of the white men is seated at W, and the player of the black men at B. White counts round from the ace-point of Black, and Black counts round from the ace-point of White. These ace-points are respectively seen to have two men upon them in opposite corners of the same table. The grand object of the game is for each party to get all his men played round into the table containing the aces, removing them from point to point agreeable to the throws of the dice. In throwing, the number upon each die turned up may be reckoned by itself, or collectively, with the number on the other die. Thus, if quatre be thrown by one die, and size by the other, a man can be advanced 4 points, and another 6 points; or one man can be advanced 10 points, always providing that a point is open to suit this movement to it. No point can be moved to if covered by two men belonging to the adversary. If covered by only one man, which is called a *blot*, then that man can be hit, and be removed from the point, and placed on the bar between the tables, his place being taken by the

W



B

The Backgammon Board.

man who has won it. The removal of a man to the bars throws a player considerably behind in the game, because the man must remain out of the play till the dice turn up a number corresponding to one open point on the adversary's table. Being fortunate to get an open point by this means, the man must be entered and wrought round from thence, as in the case of others in the set to which he belongs. The frequent occurrence of this hitting of a blot gives an adversary a great advantage, and allows him to win the gammon. There are two kinds of victory—winning the hit, and winning the gammon. The party who has played all his men round into his own table, and by

BACKGROUND—BACKSLIDE.

fortunate throws of the dice has borne or played the men off the points first, wins the *hit*. The gammon may be explained as follows: When you have brought all your men round to your own table, covering every point, and your adversary has a man out, then you are enabled to *bear* or lift your men away. If you can bear all away, so as to clear your table before the adversary gets his man placed by a throw on your table, you win the gammon. If the adversary has been able to bear one before you have borne all your men, it reduces the victory to a hit. Two hits are reckoned equal to one gammon in playing matches. To win two games out of three is called winning the *rub*, as at whist.

BACKGROUND, n. *băk'ground* [see **BACK** 1]: ground in the rear or behind; parts dimly seen; in a picture, the part behind and subordinate to the principal figures. **BACKROOM**, n. *băk'rôm*, a room in the back part of the house. **BACKSIDE**, n. *băk'sîd*, the hinder part; the rear; the wrong side. **BACKPIECE**, n. *băk'pēs*, piece of armor which covers the back. **BACKSETTLER**, n. *băk-sēt'ler*, one settled in the outlying districts of a new country. **BACK'HANDED**, a. [*back*, and *hand*]: with the hand turned backward; indirect. **BACK'ING-UP**, in *cricket and other games*, the act of playing up keenly; in *metals*, filling up back with metal or other materials.

BACKHUYSEN, *băk-hoy'zn*, **LUDOLPH**: one of the most famous painters of the Dutch school, a master in marine painting: 1613–1709; b Emden. His parents intended him for a commercial career; but he soon turned to painting. He was a close student of nature; often, on the approach of a storm putting to sea in a boat, in order to watch and sketch its effects, which he transferred to canvas immediately on his return home. His most famous picture is the sea piece in the gallery at Paris, which he was commissioned to paint by the magistrates of Amsterdam, and which was, 1665, sent as a present to Louis XIV. In all his pictures, the utmost truthfulness prevails, while they embody all the poetry of the sea. His coloring also is excellent. After he was 71 years old, he began etching on copper.

BACKOFEN, *băk'ō-fen*, **J. G. HEINRICH**: 1768–1840: German musician and musical composer. He was remarkable for his ability upon the harp, the clarinét, the flute, etc. Birckmann had taught him the art of playing these instruments, and from Grubert he had learned to compose. He has left a great number of compositions, and two treatises on the art and method of playing various instruments.

BACKSHISH, or **BACKSHEESH**, n. *băk'shēsh* [Pers. *bakhshish*, to give]: in the *East*, a present or gratuity, generally of money; properly spelled **BAKSHISH** (q.v.).

BACKSLIDE, v. *băk-slîd'* [see **BACK** 1]: to slide back; to fall out of the right path; to fall into error; to fall off; to turn away from gradually. **BACKSLID'ING**, imp. **BACKSLIDER**, n. *băk-slî'dēr*, one who falls from religion and the practice of virtue.

BACK-SPRENT—BACKWARDATION.

BACK-SPRENT, n. *băk'sprĕnt* [Eng. *back*; Scotch, *sprent*, a spring, anything elastic]: the backbone; a reel for winding yarn, which rises as the reel goes round, and gives a check in falling, to direct the person employed in reeling to distinguish the quantity by the regulated knots; the spring or catch which falls down and enters the lock of a chest; the spring in the back of a clasp-knife.

BACKSTAIRS, n. plu. *băk'stārz* [see **BACK 1**]: the stairs in the back part of a house; a private or indirect way. **BACKSTAIR**, a. indirect; private; undue. **BACKSWORD**, n. *băk'sōrd*, a sword having a back and one sharp edge. **BACKSTAFF**, n. *băk'stăf*, an instrument for taking altitudes, now superseded by the quadrant.

BACK-STAYS: long ropes from the topmast-heads down to the sides of a ship, where they are fastened in such a way as to assist the shrouds in supporting the masts. Different kinds are distinguished as *after-B.*, *breast-B.*, and *travelling-stays*. One rope generally forms a pair of B.; being looped in the middle to pass over the mast-head.

BACKUS, *băk'ŭs*, CHARLES, D.D.: 1749, Nov. 9—1803, Dec. 30; b. Franklin, Conn. He graduated from Yale College 1769, studied theology, received license to preach 1773, and 1774 till his death was pastor of the Congl. Church at Somers, Conn. He was offered, but declined, a professorship of theology at Dartmouth and at Yale; but taught many theological students at his own home. Among the latter were several who became distinguished, including Pres. Moore of Amherst and Dr. Leonard Woods of Andover. He published a work on regeneration, and a number of sermons on a wide variety of topics.

BACK'US, ISAAC: 1724, Jan. 9—1806, Nov. 20; b. Norwich, Conn. He commenced preaching 1746, two years later was ordained, and was settled over a Separatist church at Titicut, partly in the towns of Bridgewater and Middleborough, Mass. Part of his parishioners embraced Bapt. doctrines, and with them 1756 he formed a church of that faith. He was sent by the Warren Assoc. to present to congress the claims of Baptists to the rights given other denominations, was a delegate to the state convention that adopted the national constitution 1788, and for 34 years was a trustee of the institution that is now Brown University. He published *A History of New England, with Special Reference to the Baptists*, 3 vols.; and other works.

BACKWARD, a. *băk'wĕrd* [*back 1*, and *ward*]: unwilling; slow: AD. also **BACKWARDS**, towards the back; back; in time past. **BACK'WARDLY**, ad. *-lĭ*, with the back forward; perversely. **BACK'WARDNESS**, n. the state or quality of being backward.

BACKWARDATION, n. *băk'wĕrd-ă'shŭn* [formed from Eng. *backward*]: on the *Stock Exchange*, a payment made, by a speculative seller, for carrying forward stock, shares, etc., to the next account-day, instead of making a settlement, or giving delivery at the proper time.

BACKWOODS—BACON.

BACKWOODS, n. plu. *băk'woodz* [*back* 1, and *woods*]: the unsettled parts of a new country. **BACKWOODSMAN**, n. *băk'woodz-măn*, one who inhabits the far-off woods in America.

BACK-WORM, n. *băk'werm*: a small worm sometimes found in a hawk's body near the kidneys, when the bird is diseased.

BACOLOR, *bă-kō-lŏr'*: town of the island of Luzon, Philippines; the cap. of the province of Pampanga, 38 m. n.w. from Manila; in a plain, near the river Pampanga, with which it is connected by a canal. Pop. 8,737.

BACON, n. *bă'kn* [old Dat. *backe*, a pig: OF. *bacon*, a sty-fed hog: AS. *bucon* or *bucen*, beech-mast on which swine fed; the Teutonic root seems allied to the Lat. *vacca* (in mid. Lat. *buca*), a cow, and to have signified an animal in general; *bache*, in Ger., signifies among hunters a wild sow; *bake*, in Dutch, a swine in general]: the salted and dried sides of a pig or swine: bacon hams are the hind-legs cured. See **HAMS**: **PORK**. To **SAVE ONE'S BACON**, to preserve one's self from injury; to escape loss.

BACON, *bă'kon*, **ANNE (COOKE)**: about 1528-1600; daughter of Sir Anthony Cooke, who was tutor of Edward VI. She married Sir Nicholas B. and was the mother of Lord Francis B. Her three sisters married eminent men. She was highly educated by her father, translated various important works, and was noted for learning and piety.

BACON, **DELIA**: 1811, Feb. 2—1859, Sep. 2; b. Tallmadge, O.; daughter of David B. and sister of Leonard B. She was a successful teacher, and while in Boston, where she lived several years, delivered lectures. She published *Tales of the Puritans*; *The Bride of Fort Edward*; and *Philosophy of the Plays of Shakespeare Unfolded* (1857). In the latter work, to which Hawthorne furnished a preface, she endeavored to prove that the Shakespearian plays were written principally by Lord Bacon. She died at Hartford.

BACON.

BA'CON, FRANCIS, LORD VERULAM, VISCOUNT ST. ALBANS: 1561, Jan. 22—1626; b. London; son of Sir Nicholas Bacon (q.v.). His mother was the learned Anne Cooke. In early childhood, he manifested superior powers, and an ardent love of knowledge; his intelligence was so precocious, and his sedateness so remarkable, that the queen took pleasure in calling him her 'young Lord Keeper.' At the age of thirteen, he was sent to the University of Cambridge, which he quitted, after a residence of three years, with a low opinion of the course of study pursued there, and, as well, of the Aristotelian philosophy. On leaving the university, he went to Paris, in the suite of Sir Amias Paulet, the English ambassador, and there occupied himself chiefly with statistics and diplomacy, the result of his studies and observation being a work, afterwards published, *Of the State of Europe*. The sudden death of his father, 1579, Feb., recalled young B. to England, where, after failing to procure from the government a provision which would enable him to devote himself to science and literature, he betook himself for several years to the study of law. His professional progress was at first very slow, and it was long before he could obtain promotion in the public service. This was owing chiefly to the hostility of his uncle, the queen's first minister, Lord Burleigh (see CECIL), who regarded him as a dangerous rival to his own son. To Lord Burleigh and his son, B., in the hope of advancement, had paid court till it was clear no favor was to be expected from them, when he betook himself to their rival, the Earl of Essex, whose friendship he speedily won. But the earl's influence could not counteract the continued opposition of the Cecils, through whom he was defeated, 1594, in an attempt to obtain for B. the then vacant office of attorney-general. What the earl could do for his friend, however, he did, for shortly after this disappointment he presented him with an estate at Twickenham worth £2,000 a year. It is painful to relate that B. repaid the generous friendship of his patron with flagrant ingratitude. When Essex was subsequently brought to trial for a conspiracy against the queen, B. came forward as his accuser with tongue and pen; he unnecessarily appeared as counsel against the friend who had so largely obliged and confided in him, and used all his great talents and ingenuity as a pleader to magnify his crimes and secure their punishment. B. was straitened at the time in his circumstances through his extravagant mode of life, and, moreover, was anxious to conciliate the court, whose anger he had provoked by having espoused the popular cause on his first entering parliament as member for Middlesex, 1595. But whatever the temptation was, it cannot affect our opinion of conduct so mean and immoral. It remains to be stated, that, after the earl's execution, he wrote, at the request of the queen, *A Declaration of the Practices and Treasons Attempted and Committed by Robert Earl of Essex*, which was printed by authority.

In 1590, B. obtained the post of Counsel Extraordinary to the queen, and a few years afterwards, he entered parliament as member for Middlesex. It was not, how-

BACON.

ever, till the reign of James I. that he made rapid progress. He was knighted 1603, and in the following year was appointed salaried counsel to the crown; by 1613, he had advanced to the office of attorney-general, in which he unconditionally subserved the purposes of the court. His conduct as attorney, in attempting to extort by the rack a confession of treason from an old clergyman of the name of Peacham, has met universal and deserved condemnation. His cringing to the king and the royal favorite, Villiers, was not without reward. In 1617, he was appointed Keeper of the Great Seal, and in 1619 attained the dignity of the Lord Chancellorship, with the title of Lord Verulam. In the year following he was created Viscount St. Albans.

Having attained the highest honors of the state by truckling to the king and his favorite, B. proceeded to abuse his judicial functions to increase his revenues, which, great as they were, were unequal to his extravagance. Though his official income was great, and his means had been enlarged by a marriage with the daughter of a wealthy alderman, he could support this style of life only by contracting debt and accepting bribes from suitors. Nor was money his only motive to false judgments; he more than once polluted the stream of justice to maintain the favor of Buckingham. By 1621, the state of the courts had become so scandalous as to call for a parliamentary inquiry, which resulted in his being convicted, on his own written confession, of twenty-three acts of corruption. In consequence, he was condemned to pay a fine of £110,000, and to be confined in the Tower during the king's pleasure; he was banished for life from the court, and declared unfit to hold any office of state, or to sit in parliament. The fine, however, was remitted; the imprisonment lasted only two days; he was allowed again to appear at court, and, indeed, was summoned to sit in the very next parliament. Age, however, failing health, and perhaps shame, prevented him from appearing. Banished from public life, he henceforth devoted himself to literature and science, enjoying from the government a pension of £1,200, and an annual income, in all, of £2,500. His mode of life continued to be so prodigal and ostentatious that, at his death, 1626, his debts amounted to over £22,000. The immediate occasion of his death (as related by Aubrey, who probably got it from Hobbes, B.'s intimate friend) was cold caught in making an experiment to test the power of snow to preserve flesh. He died in the house of the Earl of Arundel, to which he had been removed with the fatal chill upon him which he had caught in the course of the experiment.

While, on the whole, the public life of Lord B. is marked by meanness and dishonor, his literary and scientific works are everywhere irradiated by the powerful light of an intellect which towered over that of other men. The first edition of his *Essays* appeared 1597; his two books of the *Advancement of Learning*, 1605; his *Wisdom of the Ancients*—in Latin—1610; a third edition of his *Essays*, greatly extended, 1612; his two books of the *Novum Organum*, or second part of the *Instauratio Magna*, designed to consist of six parts—also in Latin—1620; his *History of*



BACON.

A. D. 1561-1626.

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the Reign of Henry VII., 1622; his nine books, *De Augmentis Scientiarum*—a Latin translation and extension of his *Advancement of Learning*—1623: he wrote also several minor works. Lord B.'s writings embrace almost all subjects, from jurisprudence—which he treated not as a mere lawyer, but as a legislator and philosopher—to morality and medicine. The *Sermones Fideles* is a treasury of the deepest knowledge of human relations, conveyed in a gorgeous and energetic style. Almost the only science with which he was unacquainted was that of mathematics. Thus singularly gifted and accomplished, he appeared at a time when science, from a variety of causes, started on that progress which has never since been arrested. If it is now a question how far he contributed by his genius to that progress at its commencement, it is a fact that he was long commonly regarded by his countrymen as the father of Inductive Philosophy—inventor and first teacher of the method of interrogating nature by observation and experiment and inductive reasoning. Nor are his writings wanting in materials, qualified *ex facie* to support his title to that eminence. His claim to the distinction, however, has of late been the subject of much controversy, the result of which is that it has been generally disallowed. But if it be true that he had a somewhat vague and imperfect apprehension of the philosophy of induction, overestimated the province of observation, and undervalued the use of deduction and hypothesis, and that even his classification of the sciences in the *De Augmentis*, on which his reputation long turned, has been properly superseded by the superior and better-reasoned classification of M. Comte; still it must be borne in mind that he was one of the first that was aware of the true character of the positive philosophy, and who understood its conditions, and foresaw its final supremacy; and as for his classification, that it was a marvellous effort of reason at a time when the sciences were in their infancy, and many of them were yet unborn. Also, it must be said, that if B. cannot be claimed by the physicist as the father of their science, and they must look rather to Galileo, yet he may fairly be claimed in that character by the students of man and society; for he was the first to aim at the extension of the methods of positive philosophy to moral and social conceptions. If recent criticisms have dethroned him from the position which for centuries he occupied in relation to the physical sciences, by showing that his doctrines, experiments, and writings have not materially affected their course, it is only to leave him free to be placed in a position no less dignified in relation to human and social philosophy.

As a writer, B. presents in combination an intellect at once one of the most capacious and profound that ever appeared among men—one of the most penetrating, one of the most far-reaching—and an imagination almost equally remarkable. In no other writer is so much profound thought to be found expressed in such splendid eloquence. 'If,' says Hallam (*Literature of Europe*, iii. 218), 'we compare what may be found in the sixth, seventh, and eighth books *De Augmentis*, in the *Essays*, the *History of Henry VII.*, and

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the various short treatises contained in his works on moral and political wisdom and on human nature, from experience of which all such wisdom is drawn, with the Rhetoric, Ethics, and Politics of Aristotle, or with the historians most celebrated for their deep insight into civil society and human character—with Thucydides, Tacitus, Philip de Comines, Machiavel, Davila, Hume—we shall, I think, find that one man may almost be compared with all of these together.'

The collected works and life of Lord B. were published by Mallet in five vols. (Lond. 1765); a good edition is that of Montague (16 vols. Lond. 1825-34); but the best, it is generally admitted, is the last (Works, seven vols., edited by Spedding, Ellis, and Heath, 1858-9; Letters and Life, seven vols., by Spedding, 1862-74). Spedding annihilates the authority of Macaulay's brilliant but one-sided and ill-informed review of B.'s character (the *Essays*). See also the *Personal History of B.*, by Hepworth Dixon; and Campbell's *Lives of the Chancellors*; Kuno Fischer's *Franz Bacon* and Remusat's *Bacon*.

BACON, JOHN: 1740-99, Aug. 7; b. London: a distinguished statuary. He was at first a painter on porcelain, and began to work in marble at the age of 23; yet in 1769 he received the first prize from the Royal Acad., of which he was soon after made a member. His statue of Mars established his fame. Among his principal works are two busts of George III., one in Christ Church College, Oxford; the other in the univ. library at Göttingen; the monuments of Lord Chatham in Westminster Abbey and in Guildhall; the statues of Howard and of Samuel Johnson in St. Paul's, and that of Blackstone at Oxford. B. was deficient in imagination, and had no refined perception of beauty.

BA'CON, LEONARD, D.D., 1802, Feb. 19—1881, Dec. 24; b. Detroit, Mich. (where his father was a missionary); d. New Haven, Conn.: an American clergyman. He studied at Yale College and Andover Theological Seminary, and in 1825 was called to the pastorate of the First Congregational Church at New Haven, retaining the position until 1876, when he was chosen professor of theology, and subsequently lecturer on ecclesiastical history, in Yale College. His connection with religious periodical literature began as early as 1826, when he became one of the editors of *The Christian Spectator*, continuing to act as such until 1838. In 1843, he aided in establishing *The New Englander*, to which he was a frequent contributor until near the close of his life. In 1847, he was one of the founders of a weekly newspaper, the *New York Independent*, of which he was one of the editors until 1863, and also wrote largely for it, after retiring from the active editorial management of it. Dr. Bacon bore a prominent part in the more secular affairs of his denomination, and in the discussions upon the moral and social questions of the time. He also wrote several books, among which are *Life of Richard Baxter* (1830); *Manual for Young Church Members* (1833); *Historical Discourses on the Completion of Two Hundred Years from the Beginning of the*

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First Church in New Haven (1839); *Slavery Discussed in Occasional Lectures from 1833 to 1838* (1846); *Christian Self-Culture* (1863); an *Introductory Essay to Conybeare and Howson's St. Paul* (1868); besides a large number of published *Addresses* before various college associations. The great bulk of his written productions are, however, to be found in his numerous contributions to current religious literature.

BACON, LEONARD WOOLSEY, D.D., M.D.: clergyman: b. New Haven, Conn., 1830, Jan. 1; son of Leonard B., D.D., of First Church, New Haven. He studied at Yale, where he graduated 1850, and then studied theology at both Andover and Yale, and medicine at the latter college, being given his degree in 1855. He preached in Congl. and Presb. churches in various cities and towns; lived five years in Europe; and in 1877 became pastor of the Park Congl. Church, Norwich, Conn. In 1885 he was chosen pastor of the Woodland Presb. Church, Philadelphia, Penn. Leaving Philadelphia, he had pastoral charge of the Ancient Independent Church, Savannah, Ga., for several months, returning 1887, Dec., to Norwich, Conn. He is well known as a writer, having contributed to numerous periodicals, and also as a musical composer. His published works include: *Congregational Hymn and Tune Book* (1857); *The Life, Speeches, and Discourses of Father Hyacinthe* (1872); *The Vatican Council* (1872); *Church Papers* (1876); *A Life Worth Living: Life of Emily Bliss Gould* (1878); *Sunday Observance and Sunday Law* (1882); *The Hymns of Martin Luther* (1883); *The Church Book: Hymns and Tunes* (1883); and *The Simplicity That Is in Christ* (sermons, 1886).

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BA'CON, NATHANIEL: about 1630-1677, Jan.; b. Suffolk, England. He was educated in London, and emigrated to Va.; was chosen member of the council 1672; led the colonial milit. forces against the Indians, and resisted the policy of Gov. Berkeley, who proclaimed him a rebel 1676, May 29. He was tried and acquitted, and died while attempting to force the gov. to fulfil his promises.

BACON, SIR NICHOLAS: 1510-79, Feb. 20.; b. Chiselhurst, Kent.: father of Lord Bacon. With excellent education, and good natural abilities, he prospered in the legal profession, and at the age of 27 he was appointed solicitor to the Court of Augmentations; two years later, on the dissolution of the monasteries by Henry VIII., he had the courage to present to that irascible monarch a project for applying a part of the wealth 'rescued' from the church, in founding a college for the study of politics and diplomacy. Unfortunately, the king had already squandered it in presents. Henry advanced B., 1546, to the office of Attorney of the Court of Wards, which he retained during the reign of Edward VI.; but his Protestantism caused him to be deprived of all public honors and emoluments at the Rom. Cath. succession. On the death of Mary, he was made by Queen Elizabeth a member of the Protestant part of the Privy Council; and in 1558, received at her hands the Great Seal. In the beginning of 1559, he opened parliament with a judicious speech on the difficult subject of a national religion. He was also president of that assembly of ecclesiastical disputants which met in Westminster two months later, to discuss the points of controversy between Protestants and Rom. Catholics. In 1564, he suffered a temporary eclipse of royal favor; but through the efforts of his constant friend, Sir William Cecil, he was restored to favor, and Elizabeth even visited him, 1577, at his magnificent mansion of Gorhambury, Hertfordshire.

BACON, ROGER: 1214-92 (or 94); b. Ilchester, county of Somerset, Eng., of a respectable family: English monk, who, through the force of his intellect, raised himself far above his age, made wonderful discoveries in several sciences, and contributed much to extend the scanty knowledge of nature. He studied at Oxford; then at Paris, where he received the degree of doctor in theology; and soon after his return home, he entered the order of the Franciscans, and settled at Oxford. Physics seem to have been at that time the chief object of his labors; and liberal friends of science supplied him with the means of pursuing his researches. In exploring the secrets of nature, he made discoveries and invented applications which were looked upon by the ignorant as the work of hellish magic. This prejudice was encouraged by the jealousy and hate with which his brother monks regarded his superiority. Besides, he loudly denounced the ignorance and immorality of the clergy, especially of the monks, and even wrote a letter to the pope, in which he represented to him the necessity of clerical reform. Out of revenge, an accusation was brought against him at the papal court, and the pope interdicted him from teaching in the university. He was shortly afterwards imprisoned, forbidden all human intercourse, and

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hardly allowed sufficient food. Among the few clear-sighted men who admired Bacon's genius, and pitied his misfortunes, was the cardinal-bishop of Sabina, at that time papal legate in England. He desired to see Bacon's writings, but the interdiction of the Franciscans prevented a compliance with his wish. On his ascent to the papal throne as Clement IV., B. wrote to him, expressing his readiness to furnish him with whatever he desired, and Clement in reply repeated his request to see B.'s works, in defiance of the Franciscan prohibition. B. accordingly drew up his *Opus Majus* (edited by Jebb, 1733), which he sent, with two other works, it is said, to the pope, by his favorite pupil, John of London, and in which he represented the necessity of a reformation in the sciences through a diligent study of the languages and of nature. How Clement received them is not well known; but they could only have reached him about the time when he was seized with his last illness. For ten years after Clement's death, B. was free from open persecution at least. But in 1278, under Nicholas III., the general of the Franciscan order, Jerome of Esculo, declared himself against B., forbade the reading of his books, and issued an order for his imprisonment, which was sanctioned by the pope. The new imprisonment lasted ten years. When Jerome of Esculo became pope, under the name of Nicholas IV., B. sent him a *Treatise on the Means of warding off the Infirmities of Old Age* (Lat. Oxf. 1590; Eng. by Brown, 1683), with a view to convince him of the harmlessness and utility of his labors, but in vain. What the pope refused to the representations of the old philosopher, was yielded to the intercession of several influential English noblemen, and B. at last recovered his freedom. He returned to Oxford, wrote a compendium of theology, and shortly afterwards died.

B., although an extraordinary genius, could not rid himself of all the prejudices of his times. He believed in the philosopher's stone and in astrology. His chief invention is the magnifying-glass. There are also in his writings new and ingenious views on optics; for example, on refraction, on the apparent magnitude of objects, on the great increase in the size of the sun and moon in the horizon. On other subjects he fell into the greatest errors. He made several chemical discoveries which were wonders at that time. He knew, for instance, that with sulphur, saltpetre, and charcoal we may imitate lightning, and produce explosions. Mathematics, applied to observation, he considered the only means of arriving at a knowledge of nature. He studied several languages, and wrote Latin with great elegance and clearness. Deserving of honorable mention are his discoveries of the errors that prevailed in the calendar, and his proposals and data for remedying them, in which he came very near the truth. He prepared a rectified calendar, of which a copy is preserved in the Oxford library. On account of his extensive knowledge, he received the name of 'Doctor mirabilis.' Several of his works have never been printed, and are preserved among the Cottonian manuscripts in the British Museum; some are to be found in French libraries.

BACON BEETLE—BACTERIA.

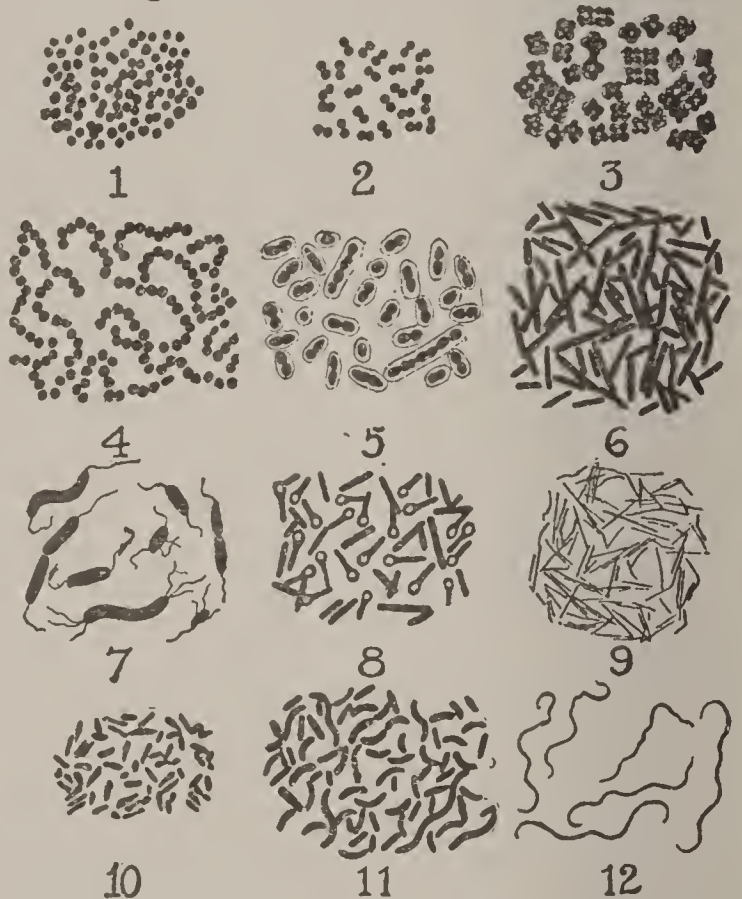
BACON BEETLE: see DERMESTES.

BACONIAN, adj. *bā-kō'nī-ăn*: of or pertaining to Lord Bacon or his philosophy.

BACTERIA, *băk-tē'rī-a*, n. plu. of BACTERIUM (q.v.). BACTERIAL, or BACTERIAN, adj. of, pertaining to, or like bacteria; caused by bacteria; as, *bacterial* diseases. BACTERIFORM, adj. having the form of a bacterium; bacterioid. BACTERIOID or BACTEROID, adj. resembling or allied to bacteria; n. a stage of certain bacteria at which they resemble forms of the genus *Bacterium*. BACTERIOLOGY, n. department of biology which deals with bacteria. BACTERITIC, adj. caused or characterized by bacteria. BACTERIUM, n., *băk-tē'rī-ăm*: plu. BACTERIA, *-rī-a* [Gr. *bakterion*, dim. of *baktron*, stick, staff]: a schizomycete or microscopic fission-fungus; a microbe.

Bacteria is a general name given to a large class of minute one-celled vegetal organisms that possess no chlorophyll, and which reproduce by equal fission, or by means of spores formed at the ends or in the body of the organism.

Their exact position in the scale of life is still in dispute; but the weight of evidence goes to show that they are plants, and that they are fungi. From the evolutionary point of view



Forms of Bacteria.

1. Spheroidal bacteria (*Micrococcus pyogenes*), one of the most common species of bacteria, causing suppuration. 2. Spheroidal bacteria arranged in pairs (*Diplococcus*). 3. Spheroidal bacteria grouped in cuboidal masses (*Sarcina*). 4. Spheroidal bacteria grouped in chains (*Streptococcus*). The species shown in the illustration is *S. erysipelatis*, producing erysipelas. 5. Diplococci slightly lance-shaped, and surrounded by a capsule. This species (*Diplococcus pneumoniae*) is the most common germ, causing acute pneumonia. 6. The bacterium causing typhoid fever (*Bacillus typhosus*). 7. Bacilli with cilia. 8. Bacilli with spores. This species (*Bacillus tetanei*) produces lockjaw. 9. The bacillus of consumption (*Bacillus tuberculosis*). 10. The bacterium of diphtheria (*Bacillus diphtheriae*). 11. The spirillum (*S. cholerae asiaticae*) of Asiatic cholera. 12. The spirillum (*S. obermeieri*) of recurrent fever.

[From Funk & Wagnalls' *Standard Dictionary*.
By special arrangement.]

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they appear to be derived from some of the lowest algæ, the Cyanophyceæ or blue-green algæ. The relationship of the higher bacteria to the algæ is marked. On the other hand they are closely related to the yeasts. Some observers are still disposed to regard them as animals belonging to the flagellate infusoria, but this is probably a one-sided view of the matter.

The B. vary greatly in size and shape, the smallest being less than $\frac{1}{25000}$ of an inch in diameter, while some of the larger are about $\frac{1}{500}$ of an inch long. A large number of them are motile and move through the liquids in which they happen to be, by means of minute hair-like processes, the flagella, which extend from their protoplasm. These flagella vary in number: in some cases there is one flagellum at one end; in other cases there are two, one at each end; in others there are bundles of flagella at either or both ends; and in some the flagella are all around the body of the bacterium, as in *Bacillus typhosus* of typhoid fever.

The B. are for practical consideration divided into two large groups, the higher B. and the lower B. Among the higher are Streptothrix, Cladothrix, and Leptothrix; they are usually larger than the lower B., generally rod-shaped and growing in long chains. They shade off into the algæ of the simplest forms. Very few of them are of hygienic interest.

The lower B. are usually classified, though with many intermediary forms, into three main groups according to their morphology. These are:

1. Cocci (plu. of coccus); spherical forms: for sub-groups, see below.
2. Bacilli (plu. of bacillus); rod-shaped forms: for sub-groups, see BACILLUS.
3. Spirilla (plu. of spirillum); curved rod-shaped forms: for sub-groups, see SPIRILLUM.

The first of the above three groups—the *Cocci*—are B. characterized by their spherical form. A number of genera are described. Micrococci when growing singly; Diplococci when growing in pairs; Streptococci when growing in chains; Staphylococci when growing in bunches, and Sarcina when growing in packets in three dimensions. Very few of the cocci have flagella, hence they rarely are motile. Spores are rare. The different forms are widely distributed, and several cause disease in man. Thus *Streptococcus erysipelatus* is the cause of erysipelas; *Streptococcus pyogenes* and *Staphylococcus pyogenes* cause pus, abscesses, and fevers; pneumonia is caused by a diplococcus, *Diplococcus pneumoniae*; and certain kinds of digestive disturbances are constantly associated with forms of *sarcina*.

Reproduction of B. is carried on in two ways, viz., by means of spores, and by simple fission where one bacterium divides in half and forms two, continuing the process as long as sufficient food-material is found. As fission may take place every 20 minutes, the progeny of one germ may be prodigious. At the rate of one division for every hour, the aggregate number at the end of 24 hours would be

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16,777,220 individuals. When the food-material is diminished there develop either at the ends or in the body of some bacteria certain small highly refractile spherical or oblong bodies ; these are the spores. Under some circumstances, of which the character is not yet fully known, the spores are formed also when there is an abundance of food-material. The spores are particularly resistant to agencies that might produce their death, being surrounded by what appears to be a special membrane. In order to kill these spores it is necessary to practice what is known as fractional sterilization. Thus, food-material infected with micro-organisms will contain no fully developed living bacteria after being sterilized once by steam for 15 or 20 minutes, but may contain the more resistant spores which the heat does not destroy. If left for 24 hours, however, the spores have time to germinate, and a second sterilization will kill those that are then developed. For all practical purposes a third sterilization is generally sufficient to kill the most resistant spores. When B. grow rapidly they often develop a semi-gelatinous coating which unites great numbers of them in masses which are termed zooglœa.

B. are recognized by the bacteriologist, not by their shape, as most of them look alike under the microscope, but by their biological characters as they grow in culture-tubes especially devised for the purpose. Thus a large number of them develop coloring matters, blue, green, yellow, brown, black, or red. The *Bacillus prodigiosus* and the *Bacillus rosaceus* both develop brilliant red pigments closely resembling freshly shed blood. Such B. are called *chromogenic*. A number develop beautiful fluorescent shades of green : many such forms are found in water. Others have the power of rendering gelatine fluid, others coagulate milk. Some develop acids and some develop alkalies. Most of them can live only in the presence of oxygen, while others cannot live if there is any oxygen in their food-materials : such are called respectively *aerobic* and *anaerobic*. A great many B. live only on dead organic matter ; such are called *saprophytic*, while others live exclusively on living matter ; these are called *parasitic*.

The chief interest in the B., from both the hygienic and the economic point of view, is in the fact that they are capable of developing certain chemical substances, either in their own bodies or in the food-materials in which they grow, which substances can produce poisoning in man, in the lower animals, and in plants. This poisoning may be acute, as in certain forms of ice-cream poisoning, or it may be sub-acute or chronic when the B. grow in the bodies of animals or plants and produce such diseases as pneumonia, typhoid fever, consumption, or cucumber-wilt.

Not all of the B., however, develop harmful products. The greater proportion are innocuous, while others are of immense service to man and to all living things. The flavor of butter, the quality and taste of cheese, the bouquet of wines, are due in great measure to the growth of some forms of these organisms.

They are distributed everywhere in great numbers, in

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the air, in water, in ice, in milk, in butter, in all of our foods, in the soil, in plants, and in animals. A large and peculiar group grow in intimate connection with the roots of plants; their function seem to be the breaking up of the nitrogenous compounds in the soil, to provide the roots with nitrates necessary for growth of the plants. Without such groups of B. in the soil the nutritious qualities of many plant-products would be lessened. This is true especially of peas and beans and other leguminous plants. Perhaps the most world-wide value of B. is their ability to decompose all forms of organic matter and by reducing it to its simplest terms redistribute the original elements to the soil to be used again in other forms of organic life.

The historical study of B. dates back to the time of Leuwenhoek in the 17th c. Ehrenbergh in 1840 was the first to give accurate descriptions and trustworthy drawings, but the greatest advances have been made during the last 20 years by Koch and Pasteur and their followers. The methods of growing B. upon solid artificial media have enabled investigators to study the microscopic characteristics and the life-history of each individual without danger of confusing it with others.

In the study of B., inasmuch as germs other than those to be specially investigated must be excluded, the observer must have the means of 'sterilizing' all the instruments he uses, all the tubes, media, etc.: for this purpose he employs a steam or hot-air sterilizer, which kills off the extrinsic organisms. Incubators are used for the purpose of cultivating the germs. In studying a micro-organism suspected of being the cause of a specific disease—e.g., cholera—it is necessary not only to have obtained it from a person or animal suffering from the disease, but also that some B. of the pure cultivation be introduced into a healthy organism, to determine whether it will produce that disease.

The best works on the subject are Flügge, *Die Mikroorganismen* (1896); Sternberg, *Manual of Bacteriology* (1896); Migula, *Systematik der Bakterien* (1897).

See BACILLUS: SPIRILLUM: GERM THEORY.

BACTERIA, *băk'trĭ-a*: ancient name of the imperfectly known land between the w. part of the Hindu Kush Mountains, and the river Oxus (Amu or Gihon) which separated it from Sogdiana on the n. and n.e. It is generally considered identical with the modern Balkh (q.v.). B. is the supposed seat of the parent-people from which the Aryan (q.v.) or Indo-European family of nations branched off. The ancient Bactrians of historic times were akin to the Medes and Persians, and used the Zend language. B. was originally the center of a powerful kingdom in e. Persia, but we know only that Ninus, Assyrian king, with his vast army, found difficulty in conquering it, and that when Arbaces besieged the last Assyrian king, Sardanapalus, in his metropolis, he was assisted by a large force of Bactrians. It is believed that the ancient Persian religion was developed first in Bactric or Zariaspa, the capital of B., which was the headquarters of the Magi till the land was overrun by the Arabs, and a centre point of the inland trade of Asia. The modern

BACTRIS—BACUP.

town of Balkh (q.v.) is built upon its site. Alexander, on his return from Persia, left in B. a colony of 14,000 Greeks, who here extended civilization. After the death of Alexander, B. was annexed to the kingdom of Syria; but was raised to independence by its governor, Diodotus I., who founded the Greek kingdom of New B. about B.C. 256. The history of this kingdom, formerly little known, has been recently elucidated by numerous Græco-Bactrian coins found in the *topes* or burial-places of Afghanistan. These coins give the names of a series of kings, and bear indications of the political circumstances of the Greek kingdom of B. On those of Eucratides, a monarch in the age of Mithridates, are found, besides the Greek characters, others which have been proved to belong to a dialect of the Sanskrit, and have been very happily deciphered by Mr. Prinsep.

BACTRIS, n. *băk'trîs* [Gr. *baktron*, a cane, from the smaller stems being formed into walking-sticks]: genus of Palms, of which nearly 50 species are known, all American. The leaves of some are pinnate, of others entire. They are generally small palms, some very small, with slender stems; that of *B. tenuis* is not thicker than a goose-quill. Some are spiny, and form thickets not easily traversed. *B. acanthocarpa* is called TUCUM, near Bahia, and from it an extremely tough thread is obtained, which is used for making nets. *B. Maraja*, the MARAJA' palm, produces large clusters of fruit, resembling small grapes, with a thin pulp of an agreeable subacid flavor.

BACTRITES, *bak-trî'tēz*: genus of fossil *Ammonitidæ*, with a straight shell, and indented but not ramified septa. Five species have been described, all from Devonian strata.

BACULE, n. *băk'ul* [Fr. *bascule*, see-saw]: a kind of portcullis or gate made like a pitfall, with a counterpoise, and supported by two large stakes. It is usually erected before the *corps de gard*, not far from the gate of a place.

BACULITES, *băk'ū-lîts*: genus of the family of *Ammonitidæ*, differing from the true *Ammonites* (q.v.) in the perfectly straight form of the shell, which tapers to a point, and is either round or compressed. The species, like the other *Ammonitidæ*, are all fossil. B. are characteristic of the upper chalk, and appear to have existed only towards the end of the period of existence of the *Ammonitidæ*.



Baculite.

BACULOMETRY, n. *băk'ū lôm'ē-trî* [L. *baculum*, a staff; Gr. *metron*, a measure]: the art of measuring accesible or inaccessible distances or lines, by the help of staves or rods.

BACUP, *băk'ŭp*: rapidly increasing and prosperous town of Lancashire; a station of the East Lancashire railway; in a beautiful valley near the borders of Yorkshire; 15 m. n. from Manchester, 12 m. e. by s. from Blackburn. There are churches of all denominations, a mechanics' and a literary institute, reading-rooms, etc., and a beautiful market-house was opened 1867, Aug. B. has extensive cotton-factories, dye-works, brass

BAD—BADAKHSAN.

and iron foundries. There are numerous coal-mines in the neighborhood; and within a mile large woolen manufactories. Pop. (1861) 10,935; (1871) 17,199; (1891) 23,498.

BAD, a. *băd* [Cornish, *bad*; Gael. *baodh*, foolish, stupid; Ger. *böse*; Dut. *boos*; Pers. *bad*, bad, perverse]: evil; hurtful; opposite of good. **BAD'LY**, ad. *-lī*, not well. **BAD'NESS**, n. the state of being bad or vicious; want of good qualities, natural or moral. **GONE TO THE BAD**, become a depraved and worthless character.—**SYN.** of 'bad': wicked; evil; naughty; corrupt; sinful; vicious; ill.

BADA'GRY: seaport town on the Gold Coast of Upper Guinea. Formerly it carried on a large trade in slaves with the Portuguese, who here established several factories. B. now belongs to Great Britain. It was from this place that Lander and Clapperton started on their expeditions to explore the African interior. Pop. 10,000.

BADAJOS, *băd-a hōs'* (called by the Romans Pax Augusta, and by the Moors Beledaix, i.e. 'Land of Health'): cap. of the Spanish province of B.; about five m. from the border of Portugal, in a fruitful district on the left bank of the Guadiana, here crossed by a stone bridge of 28 arches. B. is a fortress of the first rank, the residence of a cap.gen., and the see of a bp., and has an old cathedral with a splendid organ, and paintings by Mateo Cerezo, and Morales, who was born at B.: a brisk traffic, chiefly contraband, is carried on with Portugal. Its chief manufactures are soap, coarse woollens, leather, and delft-ware. As one of the keys of Portugal, B. has often been a place of importance in war. It was besieged in vain by the Portuguese, 1660, and again by the allies, in the Spanish War of Succession, 1705. During the French war, B. was besieged by the French, 1808 and 9, and again 1811, when it surrendered, March 11, to Soult. It was thrice besieged by the English under Wellington: first 1811, Apr. 17, after the conquest of Olivenza, on which occasion the approach of Soult to its relief caused the siege to be raised May 14, the second time, after the battles of Fuentes d'Onor and Albuera, the city was invested 1811, May 27—June 10, but still in vain. The third investment, 1812, March 17, ended in the taking of the city by storm, on the night of Apr. 6, after a murderous contest, and a loss during the twenty days' siege, of 72 officers and 963 men killed, and 306 officers and 3,483 men wounded. Pop. of B. (1887) 22,376; (1900) 30,899.

The province of B. has 8,451 sq. m.; pop. (1900) 520,246. See **ESTREMADURA**.

BADAKHSAN, *băd-ăk-shân'*, or **BUDUKHSAN**, *būd-ăk-shân'*: territory of central Asia, between 36° and 37° n. lat., 69° and 73° e. long.; between the chain of the Hindu Kush and the Oxus. It is drained by the Kokcha, a tributary of the Oxus, and is famous throughout the East as a picturesque hill-country covered with woods, rich pasture, and fertile and well-cultivated valleys. Eastern travellers speak with rapture of its rich orchards, its fruits, flowers, and nightingales. In recent times no European traveller

BADARKA—BADEN.

has visited it except Captain John Wood, who saw it only in the winter of 1838. B. formed part of the empire of Nadir Shah, after whose death it became subject to the Afghans. In 1823 the Uzbecks, under Murad Beg, taking advantage of the disturbed state of Afghanistan, defeated the tribes of B. in a pitched battle; and two years later their subjection was completed. On the death of Murad, 1845, B. seems to have become for a time independent. The Afghans, however, soon reasserted their claims. In 1859 they conquered Kunduz, and were about to annex B., when the Mir, or head-chief, agreed to pay an annual tribute. In 1863 Jehandar Shah, the Mir of B., was superseded by Mir Mamud Shah, another of the royal family of B., supported by the Afghans. This gave rise to a struggle which ended in the nephews of Jehandar acquiring control. In 1873 England and Russia agreed on a frontier between B. and Afghanistan.—Pop. estimated 350,000.

BADAR'KA: town of Oude, India, dist. of Bainswarra; four m. e. from the Ganges, five m. e. from Cawnpore. Pop. 8,000.

BADDERLOCKS, *băd'dér-löks*, or **HEN'WARE** (*Alaria esculenta*): a sea-weed (see *ALGÆ*, where a figure of it is given), of the sub-order *Fucaceæ*, growing on rocks in deep water on the shores of Britain, Iceland, and the n. of Europe. It has a stem 4–8 inches long, pinnated with a few short leaflets, which contain the seeds, and a membranous olive-green frond of 2–12 ft. long, with a stout mid-rib. The frond being stripped off, the mid-rib forms an article of food to the inhabitants of the sea-coasts. The thinner part of the frond also is sometimes eaten.

BADE, v. *băd*: pt. of **BID**, which see.

BADÉAU, *bă-dō'*, **ADAM**; born New York, 1831, Dec. 29. He was privately educated and became a contributor to the press. In 1862 he volunteered in the army, and was attached to the staff of Brig.Gen. Thomas W. Sherman. He was wounded at Port Hudson 1863, May 27. 1864, Mar., he was appointed milit.sec. to Gen. Grant, with the rank of lieut.col., being afterward promoted col., and continued on his staff till 1869, Mar., when he retired as capt. and brevet brig.gen. U. S. A. He was appointed sec. of legation to London 1869, May, and a year later consul-gen. at the same place, remaining till 1881, Sep., obtaining leave of absence 1877–8 to accompany Gen. Grant around the world. 1882–84 he was consul-gen. at Havana; 1888 brought suit against Grant's estate, for services in compiling the general's *Personal Memoirs*; and 1890 was dropped from the retired list of the army. He d. 1895, Mar. 19.

BADEN, *bă'dên*: fashionable watering-place in the canton of Aargau, Switzerland; on the left bank of the Limmat. It is of ancient date, known to the Romans as *Therma Helveticæ*. The temperature of the baths is as high as 117° Fahrenheit. B. from the 15th to the beginning of the 18th c. was the seat of the Swiss diet. Pop. (1890) 4,000.

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BADEN, *bá'dén*, GRAND DUCHY OF: at the s.w. extremity of the German empire; 5,900 sq. m. It extends in the direction of the valley of the Upper Rhine and of the Black Forest, from the s. bend of the Main at Wertheim to the Bodensee or Lake of Constance; is bounded on the n. by Bavaria and Hesse-Darmstadt; on the e. by Hohenzollern, Würtemberg, Bavaria; and on the w. and s. by the Rhine, which separates it from Rhenish Bavaria, Alsace, and Switzerland. It is divided politically into four circles—the circle of the 'Lake,' at the s., and the circles of the 'Upper Rhine,' of the 'Central Rhine,' and of the 'Lower Rhine;' these are again divided into 79 districts.

Surface and Hydrography.—Physically, B. falls into two divisions—the w. plain, along the right bank of the Rhine, and the e. highlands; the plain occupying about a fifth of the whole duchy, and the hilly part four-fifths. Of the mountain-ranges, the Schwarzwald, or Black Forest, is the most prominent. See BLACK FOREST. For a distance of 96 m., it belongs almost exclusively to Baden. It terminates in abrupt declivities towards the w., and on the e. descends by degrees into the plateau of the Neckar in Würtemberg. It decreases in height from s. to n., its mean elevation being from about 4,000 to 2,700 ft., and is cut into sections by numerous deep and wildly romantic valleys. The most remarkable summits are Feldberg and Belchen in the s. The less elevated part of the mountainous division of B., to the n. of the Murg, receives the general name of the Neckar highlands, as far as to its intersection by the Neckar valley, on the n. side of which the Odenwald begins. Southward, in the circle of the 'Lake,' rise the extensive plateaus of the German Jura. This table-land is known by the local name of the Randen. In the plain of the 'Upper Rhine' between Altbreisach and Endingen stands the small isolated basaltic group of the Kaiserstuhl, or Emperor's Seat, rising to the height of 1,100 ft., and overlooking the Rhine.

Being drained by the Rhine and the Danube, B. belongs to the basins of two opposite seas; the sources of the Danube, however, drain only about 336 sq. m. in the n. part of the 'Circle of the Lake.' Beginning with the Bodensee, which projects three arms or bays on the n.w. into B., the Rhine, in its tumultuous course, forms the s. boundary, interrupted, however, by several encroachments of the Swiss territories upon its n. bank. From Basel to below Mannheim, the stream is the only and natural boundary. The chief tributaries of the Rhine, on the B. side, are the Neckar, the Kinzig, the Murg, the Elz, the Dreisam, and the Pfinz. On the n.e. the Baden territories are bounded by the Main, which there receives the Tauber. Except a part of the Bodensee, B. has no lake of importance. In the Schwarzwald, however, there are the following sheets of water which go by the name of lakes: Mummelsee, Wildsee, Feldsee, Titisee, and the Nonnenmattweiher, with a floating island.

Climate.—As the difference between the highest and lowest points of B.—Feldberg, which rises to a height of 4,860 ft. and Mannheim—amounts to something like 4,500

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ft., there is a great variety of climate, especially in respect of temperature. The mean temperature of the plains may be stated at 50°, and that of the highlands at 44° Fahr., so that the Rhine valley of B. is one of the warmest and most fruitful districts, not only of Germany, but of Europe; the land yielding often, in the case of maize, a return of more than three hundredfold. Walnuts, cherries, apples, and pears grow in abundance, while the w. terraces of the Schwarzwald are decked with vines. On these charming declivities, the walnut thrives at a height of 1,340 ft., the grape at 1,450 ft.; other kinds of fruit are cultivated in the higher regions to an elevation of more than 2,000 ft. The wild cherry is found even as high as 2,600 ft.; the cereals are profitably cultivated to at least an equal height. Oats rise as high even as 3,600 ft., above which are the exclusively pastoral districts.

About two-thirds of the population are engaged in the cultivation of the land, which, as may be inferred from the description, yields rich returns. About 3,200 sq. m. are occupied with fields and gardens, growing wheat, oats, rye, barley, maize, potatoes, pulse, and vegetables of all sorts. Tobacco, hemp, rape, opium, etc., yield large revenue. Meadow and pasturage occupy about a fifth of the surface. An important branch of cultivation is also the production of chestnuts, walnuts, almonds, etc. The quantity of wine produced yearly is, on an average, 14 million gallons. About 1,790 sq. m. are in forest. The Schwarzwald is one of the most remarkable pine-forests of Germany. There whole tracts may be seen of pines of the height of from 160 to 180 ft., which are exported to the Netherlands for ship-building. The rearing of cattle is carried on largely. The several kinds of stock may amount to the following numbers: horses, 73,200; asses, 700; cattle, 481,000; sheep, 189,000; goats, 22,100; swine, 480,000; making a total of 1,246,000 head of animals, representing a large amount of wealth. Honey is an important product, more than 74,000 bee-hives being kept in the duchy. Various societies exist for improving the breed of horses and perfecting agriculture.

Minerals.—The mineral wealth of the country does not seem to be valued yet as it deserves, if we may judge from the extent of mining operations carried on; but the activity of the Mining Society at Carlsruhe is yearly bringing this department of the national industry more and more into a fitting condition. Iron, lead, silver, copper, and salt are among chief productions; gold is extracted from the sands of the Rhine, near Wittenweier, and cobalt, sulphur, marble, and several kinds of precious stones are found. B. is rich in mineral springs; as many as 60 are enumerated, some sulphureous, some chalybeate, some acidulous. Hence there are a great number of much frequented watering-places, as Baden-Baden, Badenweiler, Griesbach, Petersthal, etc.

Manufactures, etc.—The increasing activity in the various branches of industrial art is testified by over 1,200 manufactories, with about 70,000 hands, and a yearly

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produce of from 40 to 50 million marks (\$10,000,000 to \$12,500,000). The industrial activity extends chiefly to the following articles: ribbons and cotton fabrics, mostly at St. Blasias; toys and trinkets, and tobacco, which occupies the first place; chicory, paper, cloth, leather, beer, wooden clocks, and articles of straw; the last two are characteristic of the Schwarzwald districts, and known all over the world. Of clocks alone over 600,000 are made annually. The chief articles of export are wine and timber, which last is sent almost exclusively to the Netherlands, and brings in a sum of at least 6 million marks (\$1,500,000). The principal imports are colonial goods, fruits, drugs, horses, wool, cotton, silk goods, iron, steel, and articles of luxury. Money was formerly reckoned in gulden or florins, of 24 to the mark of silver, a florin being equal to about 40 cents; but now, under the new universal system of the German empire, in marks, approximately equal in value to English shillings, or U. S. quarter-dollars. Weights and measures are divided according to the decimal system.

Religion, Education.—The dominant church is the Rom. Cath., whose adherents, 1890, numbered 1,028,119, or about two-thirds of the whole pop. Protestants numbered 598,678; Dissenters and Mennonites 4,335; and Jews 26,735. The school system of B. is excellent; and there are a Prot. univ. at Heidelberg, a Rom. Cath. univ. at Freiburg, and numerous libraries, museums, and collections to promote the highest culture.

Government.—The sovereignty of the grand duchy, strictly indivisible and inalienable, is hereditary in the eldest of the male line, and, failing that, of the female. The heir-apparent is styled Hereditary Grand Duke, and the other sons and daughters are called Margraves and Margravines. The sovereign is limited by a parliamentary constitution. The parliament, which meets regularly every two years, consists of two chambers. The first chamber comprises the princes of the grand-ducal house, the heads of the seignorial families (seven princes and three counts), and of the nobility—on whom, when they possess hereditary property, under feudal tenure, to the value of \$125,000, the king confers the rank of the high nobility—the Rom. Cath. archbishop and the Protestant prelate, two representatives of the universities, and eight members chosen by the grand duke, without regard to rank or birth. The second chamber consists of 63 representatives chosen for eight years, 22 for the cities, and 41 for the rural districts, giving one representative for about 21,540 inhabitants. As to the franchise, less regard has been paid in B. than elsewhere to the property qualification; every settled citizen and all state officials may take part in the nomination of electors, and may become electors; only representatives must either pay tax on a capital of 16,000 marks (abt. \$4,000), or be in possession of an ecclesiastical or secular office bringing in at least 2,500 marks (\$625). The highest deliberative and executive body in the country is the council of state.

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The grand duke is its president, and it is divided, since 1870, into the ministries—(1) of the Grand-ducal House, of Justice, and of Foreign Affairs; (2) of the Interior; (3) of Commerce. The expenditure, according to the budget estimates for 1892, was \$18,169,860; the estimated net receipts for the same year amounting to \$16,214,464. A deficit is, however, unusual in B. The above includes the budget dealing with the finances of the railways, and the steamers on the Lake of Constance. 26½ millions of florins were added to the public debt of the country by the events of 1848-9. The general debt of B., 1892 amounted to \$597,442; that on the railways to \$78,731,592. The military affairs of B. are now exclusively regulated by the imperial power; the troops of B. form the major part of the fourteenth *corps d'armée* of the empire. The effective war-strength of the army, 1868, was 43,705; peace footing, 14,263. There are three orders of knighthood, besides a medal for military service, and other decorations of merit. The capital and residence of the sovereign is Carlsruhe; the capitals of the four 'circles' are Constanzt, Freiburg, Carlsruhe (formerly Rastadt), and Mannheim.

History.—The original inhabitants of B. were Alemanni. These fell under the dominion of the Franks, the conquerors of Gaul, and submitted at the same time to the Christian religion. Under their duke, Gottfried, they made repeated attempts to regain their independence, but in vain; and the dukedom of the Alemanni was abolished, 748, by Pepin the Little. In the 11th c., a Duke Berthold, said to have been a descendant of the Alemannian Gottfried, built the castle of Zähringen in Breisgau, and with him begins the unbroken line of the princes of the House of Zähringen. A descendant of his second son took the title of Margrave of B., and became the ancestor of the still flourishing House of Baden. He died 1130. The history of this house presents, for long, little else but a succession of partitions of the territories among brothers, to be again and again reunited by one or other of the collateral branches becoming extinct. The prosperity of the country was thus greatly retarded. The present cap., Carlsruhe, was built 1715 by the reigning count, Charles III. To his grandson, Charles Frederic, who succeeded 1746, B. owes considerable accessions of territory and political importance. By favoring the policy of Napoleon, and joining the Confederation of the Rhine, he doubled his possessions in extent and population, and acquired successively the dignity of elector and the title of grand duke. In 1811 he was succeeded by his grandson, Charles Ludwig Frederic, who, five years before, had married Stephanie Louise Adrienne Napoleone, an adopted daughter of Napoleon. After the battle of Leipsic, Charles Ludwig seceded from the Confederation of the Rhine, and (1815) joined the German Confederation, in which B. holds the seventh rank.

The original constitutions or 'states' of the separate territories composing the grand duchy having mostly become extinct, the grand duke Charles granted (1818) the charter which forms the basis of the present constitution.

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Charles was succeeded in the same year by his uncle Ludwig, who was inclined to absolutism, and had to contend at first with a powerful opposition, which led him frequently to dissolve the Chambers. He succeeded, 1825, in carrying through an alteration of the constitution, extending the duration of the parliaments; after which the government and the Chambers acted more harmoniously. Ludwig dying childless (1830), was succeeded by his brother Leopold. The known liberal tendencies of this prince promised at first a new life to constitutional government; but the tide of reaction, become strong since the fall of Warsaw, soon seized the government, and the act establishing the freedom of the press, which in 1831 had been hailed with delight by B. and the whole of Germany, was, in 1832, declared impracticable and abrogated. A fluctuating contest between a reactionary government and a growing opposition was carried on till 1846, when the constitutional Bekk was made minister of the interior, and liberalism thus placed at the helm. The first effect was to calm the public mind, and to cause a split between the liberals and the radicals. The ninth parliament met (1847, Dec.) under the most friendly and promising auspices; when the French revolution (1848, Feb.), the vibrations of which were felt first by B., suddenly called the radical party into the most violent activity. Not satisfied with a multitude of liberal measures passed by the legislature, the revolutionary leaders, Hecker and Struve, aimed at establishing a republic, and stirred up an insurrection. The troops having sided with the insurgents, the grand duke fled, and a Constituent Assembly was called (1849, May). The duke had recourse to Prussian aid, and after several battles, was reinstated on his throne (1849, July). The restoration was followed by some thirty executions, consisting chiefly of soldiers that had borne arms against the government, and of a few political leaders. Upon the whole, the reactionary tendency has been less marked in B. than in most other German states, and many valuable reforms effected in 1848 have been retained. Baden has shared in recent German political and ecclesiastical disputes, especially with regard to Rom. Cath. opposition to liberalism. Yet among the improved conditions are the separation of church and state; secularization of elementary education; admission of Jews to full civic rights; and increased freedom of trade. The struggle, 1859, between the church party and the state resulted at first in favor of the church party, but, two years later, the recognition of the independence of the Rom. Cath. Church included that of the Prot. also. In the Austro-Prussian war of 1866, B. was against Prussia, and had a heavy share in the defeat; but in the Franco-German war 1870-1, B. fought with vigor against France, and became a part of the renewed German Empire. See GERMANY.

Population.—Pop. (1890) 1,657,867; (1900) 1,867,944; 1,131,639 being Rom. Catholics, 704,058 Protestants and 26,132 Jews.

BADEN—BADEN BEI WEIN.

BADEN, TORKEL: 1765–1804: b. at Fredericksburg: a Danish philologist, who took his course of studies mostly in Germany, received the degree of Doctor of Philosophy at Göttingen (1789), and was appointed prof. of elocution at the Univ. of Kiel (1794). His principal works are: *De eloquentia Paulina* (1784); *De ara deo ignoto dicata* (1786); *De causis neglectæ a Romanis tragædiæ* (1789); *Commentatio de arte ac judicio F. Philostrati in describendis imaginibus* (Copenhagen, 1792); *Briefe über die Kunst von und an Hagedorn* (Leipzig, 1797); etc.

BA'DEN-BADEN: town in the grand duchy of Baden; in a pleasant valley at the base of the Black Forest; celebrated chiefly for its medicinal springs, which were known in the time of the Romans. B. having been a fashionable place of resort so early as the days of Antoninus and Aurelius, numerous Roman antiquities have been found in the neighborhood, and are preserved in a museum here. There are several saline springs, varying in temperature from 117° to 154° F. These springs are impregnated with iron, magnesia, and lime, with sulphuric and carbonic acid, and are especially recommended in chronic cutaneous diseases, gout, rheumatism, etc. The chief spring discharges in 24 hours about 4,200 cubic ft. of water. The gaming-tables of B., the most renowned in Europe, were closed with the rest of the licensed German gaming-houses in 1872. Pop. (1900) 15,718, but the visitors during the season, which is at its height in July and August, are often double this number.

BA'DEN BEI WIEN, *bî vên* (i.e., 'Baden near Vienna'): much frequented watering-place of Lower Austria, about 15 m. s.s.w. of Vienna: the *Aquæ Pannonicæ* or *Cethiæ* of the Romans; still famous for its warm mineral springs, frequented during the season by from 12,000 to 15,000 persons chiefly from the Austrian capital. The temperature varies from 90° to about 99° F. The baths are frequented by persons of both sexes, who in the bath promenade arm in arm. Many of the Austrian nobility have palaces here. The favorite walk in the neighborhood is along the romantic valley, the Helenenthal. Pop. (1890) 11,262.

BADEN-POWELL—BADGE.

BADEN-POWELL, ROBERT STEVENSON SMYTH: British military officer; b. in London 1857; joined the 13th Hussars 1876; as adjutant served with his regiment in India, Afghanistan, and South America; assistant military secretary at Cape Town in 1887-89, during which time he took part in the Zululand operations; at Malta in 1890-93; returned to Africa in the latter year and was given charge of raising and commanding the native levies in the Ashanti operations, and for his brilliant work was brevetted lieutenant-colonel; was chief staff officer in the Matabeleland campaign; brevetted colonel and placed in command of the 5th Dragoons in 1897. In the beginning of the war with the Boers (1899-1901) he was ordered to South Africa to raise a military force there and drill it into efficiency. During the war he signally distinguished himself by his grand defense of Mafeking, Cape Colony. In recognition of his services Queen Victoria promoted him to major-general. In 1903 Baden-Powell visited the U. S. to study American cavalry tactics and methods, during which time he visited the U. S. Military Academy and other military establishments. He published several works including *The Matabele Campaign*; etc.

BADEN-POWELL, bāy'dēn-pow-ēl, SIR GEORGE SMYTH, K.C.M.G., F.R.S.: publicist and political agent: b. Oxford, Eng., 1847, Dec. 24. He graduated with distinguished honor at Oxford, 1876, having previously spent 3 years in travel through Europe, India, and Australasia, and published economic and political treatises of great value. He was private sec. to the gov. of Victoria 1877; spent 1880-1 in W. Indies, studying their economic situation, and returned there 1882 as govt. agent; was employed in diplomatic negotiations with native chiefs in Bechuana-land 1885; in Brit. America 1886; Malta 1887; was Brit. expert agent at the Bering Sea Tribunal 1893. D. 1898, Nov. 20.

BADENI, COUNT CASSIMIR FELIX: Austrian statesman; b. 1846; entered the Austrian civil service; became district chief of Zolkiew 1871; minister of the Interior 1873; governor of Galicia 1888; prime minister of Austria-Hungary 1895; and resigned with his cabinet 1897. During his administration he introduced what is known as the "language ordinance," which allowed the official use of the Czech language in Bohemia and Moravia. This caused a long period of political agitation and his fall.

BADGE: in general, any honorary decoration; either conferred by the state or sovereign, or assumed by a family for purposes of distinction. Of badges conferred for the purpose of inciting to exertion, and gratifying honorable ambition, instances are the garter of the English knight, the golden fleece of the Spanish grandee, and the button of the Chinese mandarin. Among the ancients, one of the most usual emblems of authority was a gold ring, worn generally on the fourth finger. A ring of this description was the mark of senatorial and magisterial dignity.

BADGER.

Of badges assumed for the purpose of distinction, none are more famous than the white and red roses of York and Lancaster. Henry VII. combined these two emblems, first carrying a rose per pale, white and red, afterward placing the white rose within the red one. The *bear and ragged staff*, which still exists as a sign in London, was the B. of the great Earl of Warwick. The *white hart* and *silver swan*, frequent signs to inns, have a similar origin, the first having been the B. of Richard II., and the second having belonged to the House of Lancaster. In the United States, badges, usually emblematic, indicate membership in the great societies, many of which are held in high honor from their historic associations and their beneficent work.

Different countries also have distinctive badges, usually connected with the history either of the ruling or of some former dynasty: examples are the *fleur de lis* of France (represented in the accompanying engraving of the seal of Louis VII.), and the other badges for which it from time to time makes way—viz., the cap of liberty and other emblems of republicanism, the eagles of the empire, borrowed from Rome, and the bees and other insignia which the Bonaparte family have assumed. One of the oldest and most celebrated badges in existence is the so-called jewel of King Alfred.—For the badges of different orders of knighthood, see their respective titles. See also DEVICE: CREST: COCKADE: MOTTO: RING: SIGNET: HERALDRY.



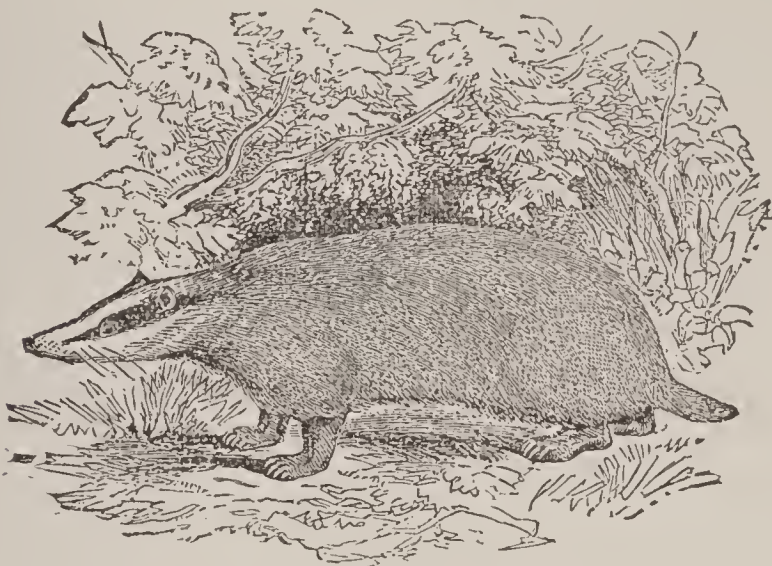
Fleur de lis of Louis VII.

BADGER, n. *băj'ér* [OF. *bladier*, a corn-dealer—in allusion to some of the habits of the *badger*—from mid. L. *bladārīūs*, a seller of corn]: a well-known nocturnal animal which burrows in the ground, formerly baited with dogs: V. to pester; to tease or annoy. BAD'GERING, imp. BADGERED, pp. *băj'érd*. BADGER, n. in *OE.*, a pedlar; a corn-factor: V. to beat down in a bargain. BADGER-LEGGED, a. -*lēgd*, having legs of unequal length, as those of the badger are popularly supposed to be.

BADGER, *băj'ér* (*Meles*): genus of quadrupeds of the Weasel family, *Mustelidæ* (q.v.), and included by Linnaeus in the genus *Ursus* or Bear, but forming a sort of connecting-link between this family and the *Mustelidæ* or Weasel and Otter family. To the Skunks (q.v.), which are ranked in that family, the badgers have a particularly strong resemblance, and their dentition and habits are almost the same. The dentition of badgers differs from that of bears chiefly in the large size of the tuberculous molar teeth at the bottom of each jaw, showing a still greater adaptation to vegetable food. Badgers, like the rest of the family to which they belong, are plantigrade, i.e., they walk on the whole sole of the foot, and not merely on the forepart of it. The body is thus brought nearer to the ground than it otherwise would be from their length.

BADGER.

of limb. The head is long, with a pointed muzzle, the tail short, the skin very thick and tough, the hair long. The gait is slow, the habits nocturnal and solitary. There are five toes on each of the fore and hind feet, and the feet are peculiarly adapted for digging and burrowing. A peculiar characteristic of the badgers, not found in any other quadrupeds of the same family, is the possession of a bag, beneath the tail, for the secretion of a peculiar substance, of a disagreeable odor, supposed to be of use in directing the sexes to each other in their solitary wanderings.—The common B. (*M. Taxus* or *M. vulgaris*) is the only quadruped of the Bear family now found in the British islands. It is widely diffused over Europe and the middle parts of Asia. It is grayish brown above, and black beneath; the head white, with a longitudinal black band on each side; the body long but robust, in size about equal to that of a small fox, the hair coarse and reaching to the ground as the animal walks. The average length is 2 ft. 6 inches, and the



Badger (*Meles vulgaris*).

height at the shoulder 11 inches. It haunts the gloomy recesses of woods, or thick coppices on the sides of hills, and digs for itself 'a deep and well-formed domicile, consisting of more than one apartment, the single entrance to which is by a deep, oblique, and even tortuous excavation.' In this, or similar excavation, the B. sleeps through the winter. The B. makes use of its nose in digging, scrapes with the fore-paws, flinging the earth as far back by them as possible, and when the accumulation is considerable, pushes it away by means of the hind-feet. The B. is extremely cleanly in its habits. It is one of the most perfectly omnivorous of animals, in a wild state as well as in confinement; fruits, roots, beech-mast, eggs, young birds, small quadrupeds, frogs, snails, worms, and insects, equally constitute its natural food. It has been known to visit a garden for strawberries. It is fond of honey, and of the larvæ of wasps and wild bees, for the sake of which it digs up their nests, its hide being impervious to their stings.

BADIAGA—BADIAN.

It is often caught by placing a sack in the mouth of its hole, when it is out at night; dogs are then sent into the wood to alarm it, upon which it flees to its hole. Dogs sent into the hole are often foiled by earth which the B. throws back upon them, to block up their way, nor is it easy for a dog to contend with it, owing to its great strength, and particularly the strength of its jaws. A barbarous sport called Badger-baiting, or *drawing the badger*, was formerly an attraction to public houses of the lowest sort. A badger kept in a barrel was assailed by dogs, and at last, yielding to superior numbers, was dragged out, upon which it was released, and allowed to go back to recover itself, and be baited again, which happened several times daily. This practice was the origin of the verb to *badger*, expressive of persevering annoyance by numerous assailants. The flesh of the B. is said to be agreeable food, particularly when cured in the form of hams. It is much used in China. The B. is easily domesticated when taken young, and becomes very familiar. In Scotland and the n. of England, a B. is still called a *Brock*, its Anglo-Saxon name; and in some parts of England it is termed a *Grey*, from which some derive greyhound.—The Balysaur of India, also called the Sand Bear and Indian B. (*M. collaris*), very much resembles the common B., but is taller, and has a more hog-like muzzle, and a longer tail. Its habits and its food are similar to those of the common B., and when attacked it defends itself with great vigor. It is found chiefly in hilly districts.—The American B. (*Taxidea Americana*) was supposed to be a mere variety of the European B., but has proved to be very distinct, so that it is now regarded by all naturalists as worthy of a separate genus (*Taxidea*), and is sometimes called *Taxel*. Its teeth are more adapted than those of the B. for carnivorous subsistence, and it preys chiefly on small animals, such as marmots, which it pursues into their holes in the sandy plains near the Missouri and the Rocky Mountains. It abounds in that region over a considerable range (notably in Wis.), but is not known in Labrador, so that its former name is perhaps the perpetuation of an error. In its pursuit of the smaller quadrupeds upon which it preys, it enlarges their burrows, and renders some parts of the plains dangerous to persons on horseback. Its prevailing color is hoary gray in winter, yellowish brown in summer, the under parts generally yellowish white; a white stripe runs from the nose over the forehead to the neck. The hair becomes not only very long but woolly in winter.—The burrowing powers of this animal are extraordinary. It sometimes makes burrows six or seven ft. deep, running under ground to a length of 30 ft.

BADIAGA, n. *băd-î-ă'ga* [Russ. *badyaga*]: genus of seaweeds belonging to the family or section *Amphibolæ*. The powder of one species common in the n. of Europe is used to take away the livid marks left by bruises.

BADIAN, n. *bā'di-ăn* [an Indian name]: aromatic cap-

BADIA-Y-LABLICH—BADMINTON.

sules or seeds much used in the East for flavoring food. See ANISE: ILLICIUM.

BADIA- Y- LABLICH, *bâ-dē'â-e-lā-blēk'*, DOMINGO; known also by the name Ali-Bei-el-Abbassi: 1767, Apr. 1—1818, Aug. 30; b. Barcelona, Spain: one of the most enterprising of modern travellers. He studied Arabic, also physical science and mathematics at Valentia. Having formed the project of visiting Africa and Asia, under the disguise of a Mussulman, for the purpose of avoiding the suspicions of the natives when visiting those places forbidden to Christians, he resigned an office under government, 1797, gained promise of official support at Madrid, prepared himself by study in London, and even underwent the ordeal of circumcision. In 1803, he sailed for Africa, where he represented himself, under the name Ali-Bei, as a descendant from the Abbasides. His tact and talents gained for him such esteem that he was invited to the court of the emperor of Fez and Morocco. After a two years' residence in Morocco, he set out on a pilgrimage to Mecca, 1805, and after sojourning some time in Tripoli, Cyprus, and Egypt, arrived at the holy place, 1807, being the first Christian that had visited it since the institution of Islam. Subsequently, he visited Jerusalem and the chief places in Palestine and Syria, and in the autumn of 1807 arrived at Constantinople, whence he had soon to flee, the reality of his Mohammedanism being suspected. After his return to Spain, he was made intendant of Segovia and prefect of Cordova; but the easy way in which he shelved his patriotism, and submitted to the French conquerors, was fatal to his prospects, for, on the expulsion of the latter, he was compelled to leave the country. He went to Paris, where, 1814, he published an account of his travels under the title *Voyages d'Ali-Bei en Afrique et en Asie pendant les Années 1803 à 1807*. His work was translated into most of the European languages. Four years after the publication, B. set off on another journey to the East, but died suddenly at Aleppo, and the pacha of Damascus seized his papers.

BADIERA, n. *băd'î-ēr'a* [from *Badier*, a French botanist, who collected plants in the Antilles]: genus of plants belonging to order *Polygalaceæ*. *B. diversifolia* is the Bastard Lignum Vitæ of Jamaica.

BADIGEON, n. *băd'î-zhŭn* [F]: a preparation of sawdust, slaked lime, powdered stone, and alum, for coloring the walls of houses; a mixture of plaster and free stone used by sculptors in repairing defects in their work; a kind of cement used by joiners, etc.

BADINAGE, n. *băd'î-názh* [F. a joke—from *badiner*, to jest, to make merry]: banter; playful talk.

BADISTER, n. *bă-dīs'tér* [Gr. *badistes*, a walker, a goer—from *badizo*, to walk slowly]: genus of predatory beetles belonging to the family *Harpalidæ*.

BADIUS, a. *băd'î-ŭs* [L.]: in *bot.*, chestnut-colored; brown.

BADMINTON, n. *băd'mîn-tŏn* [after the Duke of

BADRINATH—BAER.

Beaufort, of *Badminton*, whose favorite drink it was]: a cup of claret wine, spiced and sweetened; a favorite drink of sporting men.—B. is also a game, predecessor of, and closely resembling lawn tennis (q.v.); played with battledore and shuttlecock on a rectangular portion of a lawn. The ground is divided crosswise by a strip of net, not less than three inches wide, suspended from poles at a height of five feet. As in lawn tennis, the ground on either side of the net is divided lengthwise into right and left courts. The first player standing on a specified part of his right court, must strike the shuttlecock so as to fall across the net into the back section of the right court opposite. The opponent strikes it back, then it is returned by the first player, and so on till the first player misses the shuttlecock. After the first stroke it suffices that the shuttlecock be sent across the net, if it does not fly beyond the boundaries.

BADRINATH: see BHADRINATH.

BÆCKIA, n. *bēk'ī-a* [from Abraham Beck, physician to the king of Sweden]: genus of plants belonging to the order *Myrtaceæ*, or Myrtle-blooms; natives of Australia and China.

BAEL, or BHEL: see AEGLE.

BAENA, *bā-ā'nā*: town in the province of Cordova, Spain; abt. 24 m. s.s.e. from Cordova, on the river Marbella. It has considerable export and inland trade, chiefly in grain and oil. B. was a Roman town; and a Roman sepulchre was discovered here in 1833. Pop. abt. 13,000.

BÆOMYCES, n. *bē-ōm'ī-sēz* [Gr. *barios*, small; *mukes*, mushroom fungus]: genus of lichens, much resembling minute fungi.

BAER, *bair*, KARL ERNST VON: distinguished Russian naturalist: 1792, Feb. 29—1876, Nov. 29; b. Esthonia. He studied medicine at the Univ. of Dorpat, and in Germany he studied comparative anatomy under Döllinger in Würzburg. He was appointed prof. of zoology at Königsberg, 1819; was called to St. Petersburg, 1834, and was soon known as one of the most active members of the Academy. As a naturalist, he has occupied himself specially with embryology; and to his laborious investigations are due several most valuable discoveries in regard to the development of organic bodies. Beginning with his *Epistola de Ovi Mammalium et Hominis Genesi* (Leip. 1827), he still further elucidated this subject in his *History of Animal Development* (Königsberg, 1828–1837) and *History of the Development of Fishes* (Leip. 1835). After his return to St. Petersburg, he made the polar regions the objects of his study. He examined carefully the n. shores of Russia, and published a minute description of their fauna and flora. He suggested valuable improvements in the Russian fisheries. In 1864, the fiftieth year of his doctorate was celebrated by the Esthonian nobility, at whose expense a splendid volume was published, containing B.'s autobiography. His *Reden* and *Kleine Aufsätze*

BAETIS—BAFFIN'S BAY.

appeared 1864-75; the *Beiträge zur Kenntniss des Russischen Reichs* (26 vols.) 1864-75.

BAETIS, n. *bā-ē'tīs* [L. *baetis*]: genus of insects belonging to order *Neuroptera* and family *Ephemeridæ*. They have four wings and two setæ.

BAEZA, *bā-ā'thā*: handsome old town of Spain, province of Jaen, from the cap. city of which it is abt. 22 m. n.e. Here the younger Scipio routed Asdrubal with immense loss, taking 10,000 Spaniards prisoners. It was a flourishing city under the Moors, several of whose caliphs and kings resided here, but it never fairly recovered its sack by St. Ferdinand in the 13th c. Gaspar Becerra, the celebrated sculptor, was born here, 1720; but B. is proud chiefly of being the birthplace of the 11,000 virgins, usually named of Cologne. Its principal buildings are the univ., the old monastery of St. Philip de Neri, the cathedral, and the Jesuits' college. B. has manufactures of leather. Pop. (1878) 14,377. (1887) 13,911.

BAFFA, *bāf'fā*, the *Paphos* of ancient times: seaport town on the s.w. coast of the island of Cyprus. It has fallen much into decay, having a small trade in cotton, silk, and grain; but under the Venetian rule, it was of considerable importance. The present town occupies the site of New Paphos, which, under the Romans, was a beautiful city, with fine temples and other public buildings. The Old Paphos, famous in myth as the place where Venus landed immediately after her birth from the foam, and as her favorite residence, stood a little to the s.e. A hundred altars were here erected to her name, to which numerous worshippers, both male and female, from New Paphos, trooped annually to pay their devotions. An earthquake in the time of Augustus destroyed the Roman Paphos, but it was rebuilt soon afterwards. The Roman deputy gov., Sergius Paulus, was here converted by the apostle Paul.

BAFFETAS, n. *bāf'fě-tās*, or BAFTAS, *bāf'tās*, or BASTAS, *bās'tās* [possibly from Per. *bafti*, woven, wrought]: a plain muslin brought from India.

BAFFIN'S BAY, *bāf'inz*: a gulf, or rather sea, on the n.e. coast of N. America, between that continent and Greenland: lat. 68° to 78° n., long. 51° to 80° e.; abt. 800 m. long, with an average breadth of 280. Its greatest depth is 6,890 ft. The tides do not rise more than 10 ft. The currents are generally towards the s., though recent investigations seem to show that on the e. side of Davis' Strait and Baffin's Bay a current from Spitzbergen flows n. round Cape Farewell. The shores are for the most part lofty and precipitous, backed by ranges of snow-clad mountains. The prevailing rocks are granite and gneiss; the principal animals inhabiting the coasts are, on land, bears, black foxes, and hares; in the sea, the black whale, walrus, and seal, gulls, ducks, and other sea-fowls. The s. shore of Whale Sound on the e. coast, lat. 77° 20' n. was found by Captain Inglefield in 1852 to be inhabited. There are Danish settlements on Disco and Whale islands.

BAFFLE—BAGASSE.

Baffin's Bay communicates with the Atlantic Ocean by Davis' Strait, and with the Arctic Ocean by Smith Sound on the n., and Lancaster Sound on the w. Wellington Strait, the n.w. outlet of Lancaster Sound, was entered, 1852, by Sir E. Belcher. Baffin's Bay was first explored, 1616, by William Baffin, after whom it was called, and who was pilot of the expedition commanded by Bylot. Baffin's title to this honor seems to have been most faithfully earned; and the accuracy of his observations and descriptions have been confirmed by subsequent navigators. Whale and seal fishing are prosecuted to a large extent in Baffin's Bay, which, on account of ice, is navigable for only about two months in summer.

BAFFLE, v. *băf'fl* [Norm. F. *beffler*; OF. *baffer*, to deceive or mock: F. *bafouer*, to ridicule or disgrace: Swiss, *bafeln*, to talk idly: It. *beffare*, to jeer]: to foil or render ineffectual the efforts of another; to escape detection; to elude; to confound; to defeat; in *OE.*, to disgrace; to treat as an object of contempt. **BAFFLING**, imp. *băf'fling*: **ADJ.** causing disappointment; shifting constantly from one point to another, as baffling winds. **BAFFLED**, pp. *băf'fld*. **BAF'FLER**, n. *-fler*, one who. *Note.*—**BAFFLE** is used in the two senses of 'to foil efforts,' and in *OE.*, 'to disgrace,' which latter sense is really derived from independent root-words: Scot. *bauchle*, to treat contemptuously.—**SYN.** of 'baffle': to defeat; disconcert; confound; frustrate; discompose; foil.

BAG, n. *băg* [F. *bague*, in the old sense, a parcel or bundle: mid. L. *baga*, all one's movable property: Gael. *balg*, a leather bag or wallet: Ger. *balg*, the skin of an animal]: the skin of an animal stripped off whole; a sack; a pouch; a purse; the udder of a cow; the stomach: **V.** to put into a sack; to puff up or out. **BAG'GING**, imp.: **N.** the cloth or coarse materials for making bags; the act of putting into bags. **BAGGED**, pp. *băgd*. **BAGGY**, a. *băg'î*, resembling a bag; loose and full like a bag. **BAG'MAN**, n. in *familiar language*, a person employed to solicit orders for a manufacturer; a commercial traveller. **TO GIVE ONE THE BAG**, in *OE.*, to cheat; to deceive; *colloquially*, to dismiss from employment. **BAG AND BAGGAGE**, everything a person possesses—see **BAGGAGE** 1. **BAG NET**, a net for catching fish, shaped like a bag. **BAG'REEF**, n., a fourth and lower reef used in the British navy. **BAG'GING TIME**, n., baiting time; feeding time.

BAGARIA, *bâ-gâ-rê'â*, or **BAGHERIA**, *bâ-gâ-rê'â*: town of Sicily, province of Palermo, nine m. e. by s. from Palermo, with which it is connected by railway; beautifully situated at the base of the isthmus which separates the Bay of Palermo from that of Termini, and is surrounded by groups of palatial villas of the Sicilian nobility, abandoned after the proprietors had ruined themselves by the festivals here celebrated in honor of Queen Caroline, at the commencement of the present century. Pop. abt. 12,000.

BAGASSE, n. *bă-găs'* [F.—from Sp. *bagazo*, the remains

BAGATELLE—BAGDAD.

of pressed sugar-canes, grapes, etc.], or CANE STRAW, or CANE TRASH; in the Antilles, called BAGAUZ, n. *bă-gawz'*: refuse matter obtained during the expression of the saccharine juice from the sugar-cane. In the manufacture of sugar (q. v.), the sugar-canes, in lengths of 3 to 4 ft., are passed between heavy rollers, which only partly squeeze out the juice, and yield the bruised canes, or B., still retaining a large percentage (usually about 18) of sugar. The only use to which the B. is put is as fuel in the heating of the boilers and pans in the sugar manufactory. The improved apparatus introduced of late years has done much to save the large amount of sugar wasted in the B. and in other parts of the process, which at one time amounted to not less than one-half of the entire quantity of sugar in the sugar-cane.

BAGATELLE, n. *băg'ă-těl* [F. *bagatelle*, a trifle—from It. *bagattella*, a trifle, nonsense: F. *bague*, a trifle]: a trifle; a thing of no importance; name of a game somewhat resembling billiards. A B.-table is usually about 7 ft. long and 21 inches broad; it is lined with cloth, and a game is performed on it with small ivory balls and a cue or mace. The sport consists in striking one or more of the balls into numbered holes at one end of the board.

BAGATY, n. *băg'a-tĩ*, or BAGGETY, *băg'ět ĩ* [Eng. *bag* suggested by the gibbous aspect of the fish]: female of the Lump-fish, or Sea Owl, *Cyclopterus lumpus*.

BAGAVEL, n. *băg'a-věl* [A.S. *bycgan*, *bycgeæn*, to buy *gavel*, tax]: a tribute granted to the citizens of Exeter by a charter from Edward I., empowering them to levy a duty upon all wares, brought to that city for the purpose of sale, the produce of which was to be employed in paving the streets, repairing the walls, and the general maintenance of the town.

BAGDAD, *băg-dăd'*: a pachalic in the s.e. of Asiatic Turkey; extending from lat. 30° to 38° n., and from long. 40° to 48° e.; bounded on the n. by the pachalics of Diarbekir and Van; on the w. and s. by Syria and Arabia; and on the e. by Persia; while at its s.e. extremity lies the Persian Gulf. Extreme length, 550 m., breadth, 350. It is watered by the rivers Euphrates and Tigris, which unite their streams at the town of Korna, lat. 31° n., and long. 47° e. The pachalic is usually divided into three parts. 1. That e. of the Tigris, comprehending the district of *Khuzistan* (anciently, *Susiana*) and *Kurdistan* (part of ancient Assyria), the former rich in grain and fruit. 2. That w. of the Euphrates, a sterile waste, losing itself at last in the great Syro-Arabian desert. 3. That between the two rivers, the n. portion of which is known under the name of *Algesirah*, or 'the Island' (anciently, *Mesopotamia*), and the s. under the name of *Irak-Arabi* (anciently, *Babylonia* and *Chaldæa*). The last of these divisions, though now a barren wilderness, was in ancient times luxuriantly fertile, the seat of mighty empires, and inhabited by industrious populations. See ASSYRIA: BABYLON: NINEVEH: CTESIPHON: SELEUCIA:

BAGDAD.

etc. The barbarous misgovernment and wretched incapacity of the Turks have reduced it to its present condition. The pachalic produces, in the better-cultivated districts, crops of rice, wheat, maize, barley, with some hemp, flax, tobacco, etc., and dates are brought to great perfection. The chief wild animals are lions—not numerous—hyenas, jackals, wolves, gazelles, ostriches; the chief domestic ones are horses, asses, mules, buffaloes, camels, and dromedaries. The inhabitants are composed of Turkomans, Armenians, Turks, Jews, Arabs, and Kurds; the last two races notorious for their open and audacious depredations, their mutual wars, and their utter contempt for the authority attempted to be exercised over them. Principal cities—Bagdad, Bassora, and Mosul. Pop. 2,000,000.

BAGDAD: cap. of the pachalic of the same name; on both banks of the Tigris, lat. $33^{\circ} 20'$ n., long. $44^{\circ} 23'$ e. The city is surrounded by a brick wall, 5 m. in circumference; the two parts are connected by a bridge of boats, and the communication is guarded by a citadel. It has an extremely picturesque appearance from the outside, being encircled and interspersed with groves of date trees, through which one may catch the gleam of domes and minarets; but it loses its beauty on closer inspection. The streets are narrow, crooked, unpaved, and dirty, full of ruts, and strewn with dead carcasses, which, however, are for the most part removed by dogs, the only public scavengers in the East. The exterior of the individual houses corresponds with the repulsive aspect of the streets. They have, in general no windows towards the front, and are built of old brick; but their interior is often very gorgeously decorated. The vaulted ceilings, rich moldings, inlaid mirrors, and massive gilding bring back to the recollection of the traveller 'the golden time of good Harun Al-Raschid.' B. contains upwards of 100 mosques. These, with the khans, bazaars, and the palace of the governor, are the only noticeable buildings in the city. The domes and minarets are said to be finer than those of Constantinople, and are beautifully painted. The bazaars exhibit the produce of both Turkish and European markets; but commerce has greatly decreased since Persia began to trade with Europe by way of Trebizonde on the n., and by the Persian Gulf on the s. Nevertheless, though no longer the chief emporium of merchandise between e. and w. Asia, and though robber Kurds and Arabs lurk on all the roads that lead from the city, B. still carries on a considerable traffic with Aleppo and Damascus, and has manufactures of red and yellow leather, silks, and cotton stuffs. The value of goods that pass through the custom-house at B. in one year may be \$2,500,000. Of the inhabitants, the greater part are Turks and Arabs; the remainder are Jews, Armenians, Hindus, Afghans, and Persians. In summer, the heat is oppressive; rain does not fall on more than twenty or thirty days in the year; but when the snows melt on the Armenian hills, the Tigris becomes a majestic, and often a destructive, river. In 1831,

BAGGAGE—BAGGESEN.

an inundation destroyed one-half of the town, and several thousand lives. The plague visits the place periodically—once every 10 years. In 1831, 4,000 people perished daily for several days from its ravages. B. is chosen by many Mohammedans of the Shiah sect as a place of residence. Several steamers now ply on the Tigris to and from B.; and here is one of the chief stations of the Anglo-Indian telegraph.

B. was founded by Nebuchadnezzar, whose name and title on each brick composing a wall were discovered by Rawlinson 1848. In the 9th c. it was enlarged by Harun Al-Raschid, who erected numerous edifices on the e. side of the Tigris, and connected its two banks by a bridge of boats. The palace, built for himself, and the tomb of his favorite wife, Zobeide, are said to have been of extraordinary splendor. A hundred years later, B. was ravaged by the Turks. In 1253, the grandson of Genghis Khan, Hulaku, put an end to the old caliphate; but the descendants of this Tatar conqueror were expelled by Timur, who took the city 1393. After several vicissitudes, it remained in the possession of a Turkoman chief, whose dynasty governed until 1470. In the beginning of the 16th c., Shah Ismael, founder of the Suffide dynasty in Persia, made himself master of it; since which period it has repeatedly been a bone of contention between Turks and Persians. After a memorably obstinate siege, it was conquered by the sultan, Murad IV., 1638. Nadir Shah vainly essayed to retake it in the 18th c. It has remained under sway of the Porte. Pop. estimated 60,000–150,000.

BAGGAGE, n. *băg'gāj* [corrupted from OF. *bagasse*, a flirt]: *familiarly*, a worthless woman; a flirt; a light woman.

BAGGAGE, n. *băg'gāj* [F. *bagage*, luggage—from OF. *bagues*, goods: compare OF. *baguer*, to truss, to tuck up]: all the articles necessary for a traveller, or for an army; luggage; things required for a journey. See **LUGGAGE**. In the marching arrangements of an army, B. is placed under strict rules, in order that the accumulation of weight may not impede the movement of the troops; and similar rules are enforced in troop-ships. The term itself is made to apply chiefly to articles of clothing, and to small personal effects. A private soldier is allowed usually to carry nothing except that which his knapsack and other accouterments can hold. Officers' B. is, of course, much more considerable in amount than that of the non-commissioned officers and privates.

BAGGALA, n. *băg'ga-la* [Arab. *budgero*]: a two-masted boat, more generally called a *dow*, used by the Arabs for commerce, also for piracy in the Indian Ocean; varying from 200 to 250 tons burthen.

BAGGESEN, *băg'ě-sěn*, **JENS**: well-known Danish poet, having a place also in German literature: 1764, Feb. 17—1826, Oct. 3; b. Korsör, in the island of Zealand. He obtained reputation first by his *Comic Tales* (1785), the opera *Holger Danske* (1790), and by his odes and songs. In 1811,

BAGGING—BAGNÈRES DE BIGORRE.

he was appointed prof. of Danish language and literature at Kiel; in 1814, he removed to Copenhagen, where he became involved in an unseemly strife with Oehlenschläger, and in 1820 he left his native country altogether. Some years later, a homesickness seized him, and he set out on his return, but died at Hamburg. B.'s nature was a curious compound of pride and humility, love and hate, sensitiveness and reflective power, free-thinking and faith; and these conflicting qualities appear in his poems. In 1806, he published an idyllic epic, entitled *Parthenais oder Alpenreise*, in twelve cantos, written in hexameters, which contains single passages of great beauty. B. had no lyrical talent, and only a few of his songs show simplicity, tenderness, and originality. Klopstock was his model. His best sphere was the serio-comic. His 'humorous epic' (as he called it) of *Adam and Eve*, pub. shortly after his death, is a singular mixture of humor, pathos, levity, and earnestness.

BAGLEY, WORTH: an Amer. naval officer, b. in Raleigh, N. C., 1874; graduated at the U. S. Naval Academy 1895; appointed executive officer of the torpedo boat *Winslow* 1897. On May 11, 1898, the *Winslow* and two other vessels attempted to force an entrance into Cardenas harbor, Cuba. A shell from a Spanish gunboat killed Ens. Bagley, who was the first Amer. naval officer to fall in the war with Spain.

BAGLIVI, bāl-yē'vē, GEORGE: celebrated Italian physician: 1669, Sep.—1706; b. Ragusa; descendant of an Armenian family; named from his adoptive father, a wealthy physician of Lucca. He studied at Salerno, Padua, Bologna, and at Rome, where he enjoyed the anatomical prelections of his friend Malpighi, and was soon appointed prof. of anatomy at the college of La Sapienza, Rome, where he died. His great discovery in medical science is the system of 'solidism,' as it is called. Previous to the time of B., physicians had held the doctrine of Hippocrates in reference to the primary seat of diseases—viz., that it is in the fluids. B. adopted the theory, since prevalent though with admitted exceptions, that the real seat of disease is in the solids.

BAGNA-CAVALLO, bân'yâ-kâ-vâl'lo: inland town of Italy, formerly belonging to the Papal States; 11 m. w. from Ravenna, in the province of Ravenna. B. was a Roman city, called Tiberiacum, in honor of Tiberius. Pop. abt. 3,900.

BAGNARA, bân-yâ'râ: seaport town of s. Italy; on the gulf of Gioja, 16 m. n.e. of Reggio. Excellent wine is produced in the neighborhood. Pop. 7,000.

BAGNÈRES DE BIGORRE, bân-yair' dēh bē-gōr': town in the dept. of the High Pyrenees, France; on the Adour, at the base of Montalivet, and at the entrance to the romantic valley of Campan. Besides its extensive bathing-houses, it has a college, a theatre, a Pyrenean museum, and a trades-hall. By the Romans it was known as *Vicus Aquensis*, or *Aquæ Bigerrorum*. It was destroyed by the

BAGNÈRES DE LUCHON—BAGNES.

Goths, but the fame of its waters survived, and is now so great that it is visited by about 20,000 strangers yearly. The tepid, warm, and hot saline springs are numerous, and are recommended for cutaneous and nervous diseases. Woolens, linens, and barèges are manufactured here. Pop. abt. 8,000.

BAGNÈRES DE LUCHON—*lŭ-shōn'*, *Aquæ Convenarum* of the Romans: town in the Pyrenees, France; dept. of Upper Garonne; in a pleasant valley watered by the Pique. Its cold, tepid, and hot sulphurous waters are recommended in rheumatism, gout, cutaneous diseases, and paralysis. Pop. 4,200.

BAGNES, *báñ*: the convict-prisons of France. In ancient times, the severest punishment, next to death, was that of the galleys (q.v.). In 1748, these were abolished, and the convicts were employed in hard labor in arsenals and other public works; and the prisons in which they were lodged were called *bagnes*, from the Italian *bagno*, literally, a bath—a name supposed to have originated in the fact, that the slave-prisons at Constantinople contained baths, or because they stood near the baths of the seraglio. The Constituent Assembly, 1791, 2, mitigated the sufferings of convicts, and substituted for the detested name *galères* that of *travaux publics*, to which succeeded the *travaux forcés* of the Code Napoleon. The practice of branding criminals with a hot iron was not abolished till 1832. The latest existing institutions of this class were at Toulon, Brest, and Rochefort, at which the number of convicts, 1850, was respectively 3,873, 2,831, and 986. In these establishments, the labor of the convicts was turned to profitable account, and the various handicrafts were taught in the prison under the direction of overseers. The industrious and clever were enabled to earn small wages, and good behavior was rewarded with a gradual relaxation of restraint. Formerly the punishment of the galleys was inflicted for comparatively slight offenses, such as removing landmarks, begging, poaching, etc., but hard labor in the B. was reserved exclusively for such as committed crimes which seriously menace the public peace and personal safety. The number of these crimes, however, is not less than 51. Of 7,689 convicts (*forçats*) in 1850, 3,070 were condemned to 5–10 years; 2,239 to 11–20 years; 282 to 20–30; 41 to 30–40; 23 to 40–50; 9 to above 50; and 1,965 for life. The principal crime was theft, for which 4,750 had been condemned; for murder, 1,027. The greater proportion of the criminals, viz., 4,595, were from the rural districts; from towns, 2,452; foreigners, 643; most of them were of the age between 20 and 40; and 3,902 were unable to read or write. The most numerous class were husbandmen, threshers, gardeners, 1,278; next, day-laborers and *terrassiers* (navvies?), 1,078. The number of pardons to convicts in 1848 was 90; in 1849, 52. In 1852 the imperial government decreed the suppression of the B., and substituted in their place deportation to Guiana. But if any of the prisoners then in the B. would consider

BAGNES-LE-CHABLE—BAGPIPES.

deportation a greater punishment than what they were condemned to, it was resolved to give them the choice of remaining in prison or of being transported: 3,000 chose transportation.

BAGNES-LE CHABLE, *bân-lêh-sháb l*: parish and village in the canton of Valais, Switzerland, on the left bank of the Dranse. The parish occupies the whole valley of the Bagne. The valley was twice inundated during the 16th c.; again in 1818, when 400 cottages were swept away, and 34 lives lost. Pop. (1890) 4,254.

BAGNI DI LUCCA: *bân'yê dē lōk'ká* [*Baths of Lucca*]: large inland village of Italy, province of Lucca; 13 m. n. from the city of Lucca; one of the most frequented bathing-places in Italy. It is in one of the finest valleys of Tuscany, the valley of the river Lima, a branch of the Serchio. There are hot springs of various temperature from 96° to 136° Fahr., scattered over a limited neighborhood. Pop. of commune, abt. 8,200.

BAGNIO, n. *bân'yō* [It. *bagno*, a bath—from L. *bal-nēŭm*]: a bath; a prison; a brothel.

BAGNO A RIPOLI, *bân'yō á rē'pō-lē*: famous Italian bathing-place, in the province and circle of Florence, five m. e.n.e. from the city of Florence.

BAGNO IN ROMAGNO, *ro-mân'yō*: town of Italy, province of Florence; 35 m. e. by n. from Florence city; on the right bank of the Savio, not far from its source. It is a much frequented bathing-place, having hot springs of temperature 108°–110° Fahr.

BAGNOLISTS, n. pl. *băg'nō-lists*, **BAGNOLENSIANS**, *băg-nō-lên'shāns*, or **BAIOLENSIANS**, *bā-ō-lên'sī-āns* [*Bagnoles*, a town in Provence]: a Christian sect in the 12th c.; belonging to the branch of the Cathari, whose great principle was to admit only a single First Cause. They were one of the bodies termed *Albigenses*.

BAGNOLO, *bân-yō-lō*: town of Piedmont, province of Cuneo; 12 m. n.w. from Saluzzo, on the left bank of the Grana, at the foot of the Alps.

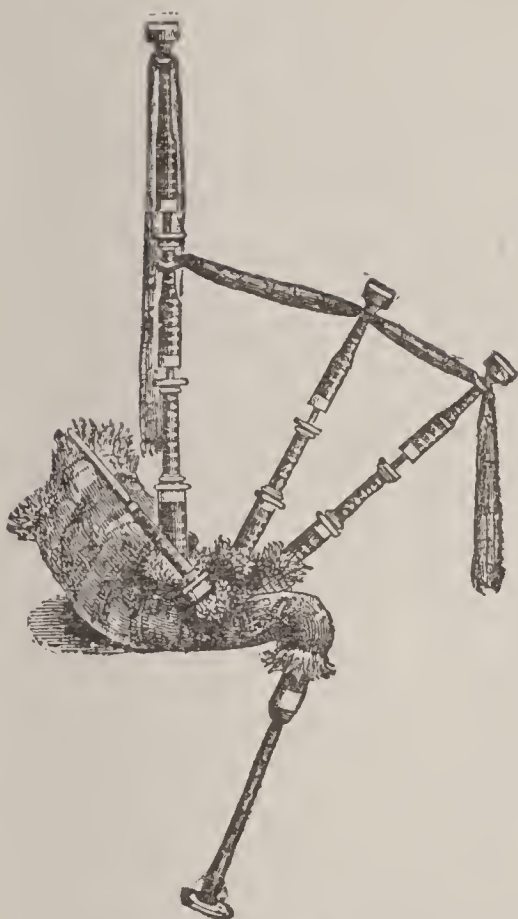
Another small town near Brescia bears this name; also a town in the province of Reggio, in Emilia; and a town of the province of Lecce, in south Italy; besides many villages in Italy.

BAGOAS, n. *ba-gō'ās* [Gr. *Bagoas*—from a Per. proper name believed to signify a eunuch]: genus of beetles of the family *Curculionidæ*, or Weevils. They are small insects found in marshes.

BAGPIPES, n. *băg'pīps* [*bag*, and *pipe*]: a musical wind-instrument which until the 18th c., was common in almost every country in Europe, and continues in use among the country people in Poland, Italy, Sicily, the s. of France, Scotland, etc.; but, lacking refinement of tone and range of notes, it has fallen into disuse. **BAGPIPER**, n. one who plays the bagpipe. The bag of the B. is of leather; the player inflates it by blowing with his mouth through a tube. The music proceeds from three or four pipes, whose mouth-

PLATE 6.

Badge
Balæna



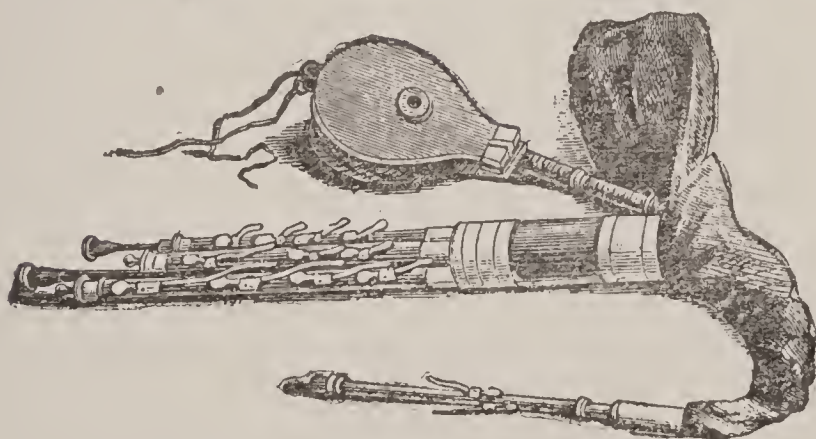
Highland Bagpipe.



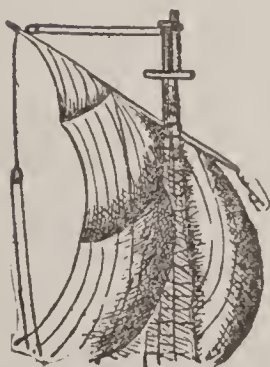
Badge of Arthur, Prince of Wales.



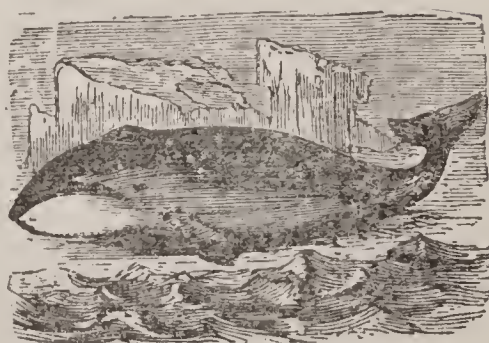
Baggala.



Irish Bagpipe.



Bagpiping the Mizzen.



Balæna.

BAGRATION—BAGSHOT BEDS.

pieces are inserted into the bag; the wind being forced out by pressing the bag under the arm. One of the pipes, the *chanter*, is a kind of oboe with eight holes, and is similarly handled; the others, called *drones*, sound each only one continuous low note. It is certain that the bagpipe was in use among the Hebrews and Greeks, and there are plenty of proofs that in Germany and elsewhere in Europe it was a favorite in the 15th c.

The B. is still popular in the Highlands of Scotland; and wherever there are gatherings of Highlanders, and even of Lowland Scotch, in England and other countries. Pipers in proper costume are also attached to the Highland regiments, and in some instances pipers are retained by Scottish noblemen to play on festive occasions. Skill in playing the B. is promoted by various Highland societies, which, at periodical competitions, give prizes to the best players of pibrochs (q.v.), reels, and other airs.

TO BAGPIPE THE MIZZEN: to lay the mizzen aback by bringing it to the mizzen shrouds.

BAGRATION, *ba-grā'shŭn*, or *bā-grā'te-ōn'*, PETER, Prince: 1756–1812, Oct. 7: distinguished Russian general, descended from the noble family of the Bagradites of Georgia and Armenia. He entered the Russian service 1783, and was trained under Suwarrow. In 1788 he was engaged at the storming of Oczakow; fought 1792, 1794 against the Poles; 1799 in Italy and Switzerland; and distinguished himself in the Austro-Russian war of 1805 against the French, especially in the sanguinary engagement of Nov. 16 of that year, when with a small body of troops, he bravely stood during six hours opposed to the superior forces under Murat, and thus enabled the Russian general, Kutusow, to reach Znaym with the main army. Subsequently, Prince B. was in the battles of Austerlitz, Eylau, and Friedland, and in the Russian campaign against the Turks, especially in the battle of Silistria, 1809. In the campaign of 1812, he commanded the second Russian army of the west, and had the misfortune to fail in his attack on Davoust near Mohilew; but succeeded in forming a junction with the west army at Smolensk. He was mortally wounded in the battle of Mosaïsk.

BAGRATIONITE, n. *ba-grā'ti-on-īt* [after *Bagration*, its discoverer]: a mineral which occurs in black crystals in the Ural Mountains. Dana makes it a distinct variety of Allanite. Hermann described a B. which is epidote.

BAGRUS, n. *bā'grŭs* [L. *bagrus*]: genus of fishes of the order *Malacopterygii Abdominales*, and family *Siluridæ*.

BAGSHOT BEDS: lowest series of strata in the Middle Eocene formation of Britain. The name is from Bagshot Heath, Surrey, where they were first examined; but, as they are more fully developed and better seen in the Isle of Wight, the rocks there are now considered the typical representatives of the series. The strata are arranged into four groups: 1. The *Upper Bagshot Beds*, composed of yellow and white sands with ferruginous stains, generally unfossiliferous, though a remarkable exception is at Whitecliff Bay, Isle of Wight, where a bed contains a large number of very friable shells.

BAGUETTE—BAHAMAS.

2. The *Barton beds*, consisting of colored clays interstratified with sand and loam. They are rich in fossils, chiefly the shells of mollusca, but contain also the remains of a fish and several reptiles. Here, too, the Nummulite (q.v.), characteristic of the Tertiary formations, makes its first appearance in a descending order. This genus dies out with the *Nummulites variolaris*, the small species found in these beds. 3. The *Bracklesham beds*, so called from their extensive development at Bracklesham Bay, near Chichester in Sussex, are composed of marly clays and white sands, capped by a bed of flint-pebble conglomerate, and resting on dark carbonaceous clays. This is the most highly fossiliferous group in the series. Two species of plants have been noticed. The remains of six reptiles and 21 fishes have been described, besides a long list of mollusca, amongst which is the magnificent *Cerithium* (q.v.) *giganteum*, conspicuous in the *Calcaire grossier* of Paris, where it is sometimes two ft. in length. The prevalence of genera now only known as inhabitants of tropical or sub-tropical seas, such as volutes and cowries, together with their companion lunulites and corals, makes it highly probable that a warm climate prevailed during the deposition of these strata. 4. The *Lower Lagshot Beds*, consisting of alternations of variously colored sands with gray, chocolate-colored, or white pipe-clays. The white clays contain the only fossil organisms found in this group—beautifully preserved leaves spread out in the layers of the clay.

The series rests on the true London clay. Its maximum thickness is about 1,200 ft.

BAGUETTE, n. *bă-gět'* [F. a rod or wand—from It. *bacchetta*, a switch, a rod]: in *arch.*, a small round molding less than an astragal.

BAGUL, or BHAGUL, *ba'gũl*: small state in n. w. India, on the s. or left bank of the Sutlej; one of the native states in feudal subordination to the Punjab government: lat. about 31° n., long. 77° e. The surface is generally mountainous, presenting two summits, Bahadurgarh and Bara Devi, respectively 6,233 and 7,003 ft. above the sea. B. has a supposed gross revenue of £6,000, pays 3,600 rupees as tribute, and has 222 men under arms. Pop. (1890) 22,305.

BAGWYN, n. [ety. doubtful]: in *her.*, an imaginary animal, like the heraldic antelope, but having the tail of a horse and long horns curved over the ears.

BAH, int. *bâ*: an exclamation expressive of disgust or contempt, or both.

BAHAMA REDWOOD: English name of a plant, the *Rhamnus colubrina*.

BAHAMAS, *ba-hĩ'maz*, or LUCAYOS, *lô-kĩ'ōs*: chain of islands stretching n. w. from the neighborhood of the n. coast of Hayti to that of the e. coast of Florida. From Florida they are separated by the channel through which flows the Gulf Stream (q.v.), and from Cuba, by the Old Bahama Channel. These are the principal passages between the open ocean and the Gulf of Mexico. The chain extends in n. lat. from 20° 55' to 27° 31', and in w. long. from 72° 40'

BAHAR.

to $79^{\circ} 5'$, having an entire length from n.w. to s.e. of about 550 m; and it rests mainly on two shoals—the Great Bank to the s., and the Little Bank to the n. There are upwards of 3,000 islands and rocks, but only about 30 of any size. The chief members of the group, reckoned from the n.w., are these: Great Bahama; Abaco; Eleuthera; New Providence; Andros; Guanahani, or Cat Island, or San Salvador; Watling's Island; Exuma; Long Island; Crooked Islands; Maricuada; Inagua; Little Inagua; Caicos; Turk's Island.

The revenue of the B., 1901–2, was \$388,900; expenditure \$405,675; imports \$1,623,600; exports \$884,420; total trade \$2,508,020 excluding precious metals. The islands generally are of reef-like shape, long, narrow, and low. With very little appearance of soil, they derive considerable fertility from the tendency of the porous rock to retain moisture. Besides excellent pasturage, they yield guinea-corn, maize, cotton, pine-apples, lemons, oranges, pimento, and a species of cinnamon. In the larger islands, too, there is excellent timber. Cotton cultivation received a great impulse during the American civil war. During the summer, the temperature ranges from 73° to 93° F.; but in the winter the climate is delightfully temperate and considered helpful for pulmonary complaints. The annual fall of rain is from 43 to 45 inches, being heaviest in Oct., Nov., and Dec., but equally distributed over the other months. A furious and most destructive cyclone visited the Bahamas, 1866, Oct. 1.

The B. were Columbus's earliest discovery. But the precise spot of his first landing has not been ascertained. Guanahani or Cat Island has generally been believed to be the San Salvador of Columbus; but recent investigations appear to have transferred the honor to Watling's Island, situated a little further to the e. The B. having been depopulated, but not again colonized, by the Spaniards, were occupied by the English, 1629—to whom, after various vicissitudes of fortune in the wars with Spain and France, they were ultimately secured by the treaty of 1783. Nassau, in New Providence, is the seat of government, and has recently been greatly improved both as town and port. During the American civil war, Nassau became the station for vessels about to run the blockade of the southern ports, and thence derived unexampled prosperity; and so far as agriculture is concerned, the impulse then received has been maintained by the Bahamas.

The area is 5,390 sq. m.; pop. (1901) 53,735. The pop. of Turk's Island, officially separate from the B., is about 4,800.

BAHAR, n. *ba-hâr'*, or BARRE, *bâr* [Arab. *bahar*—from *bahara*, to charge with a load]: two weights current in parts of the East Indies. The *Great Bahar* is 524 lbs. 9 oz. avoird., for weighing pepper, cloves, nutmegs, etc.; the *Little Bahar* weighs 437 lbs. 9 oz. avoird., for weighing quicksilver, vermilion, ivory, silk, etc.

BAHAR, *ba-hâr'* (also spelt *Behar* and *Bihar*): one of the old Mohammedan provinces of India, occupying part of the valley of the Ganges; named after its chief town (q.v.):

BAHAR—BAHIA.

a section of Lower Bengal, comprising the two divisions of Patna and Bhagulpore, and these subdivided into 12 administrative districts: 44,139 sq. m. The name B. was formerly given to one of the districts, now officially called Gayah. (*Cooch Bahar* is a native state near Bhotan; 1,307 sq. m.; pop. 602,604. Its cap. is also Cooch B., or Kuch B.) Roads and bridges can neither be well made nor maintained where, during nearly half the year, the surface of the country is inundated, and torn by innumerable torrents. In the dry season, the beds of the rivers present only detached pools. Among the minerals, the most important are coal and mica. The latter, nearly as pellucid as glass, is sometimes found in blocks, yielding plates of 36 inches by 18. Potatoes, cabbages, cauliflower, lettuces, turnips, etc., have been introduced from Europe, and thrive. Of indigenous productions, the most considerable are rice, pulse, sugar, cotton, indigo, and tobacco. The district is largely engaged in the manufacturing of muslins, silks, carpets, blankets, tents, tapes, threads, ropes, paper, glass, cutlery, jewelry, leather, ink, soap, and pottery. Ardent spirits, too, are extensively distilled from the flowers of the *Bassia latifolia* (q.v.). Before the days even of Moslem domination, B. appears to have been the centre of a Hindu empire, which native accounts describe as of matchless splendor, and of fabulous duration. Pop. (1901) 24,241,305.

BAHAR, or BEHAR, *ba-hâr*: town of Bengal, 34 m. s.e. by s. from Patna: chief town of a British dist. of the same name (q.v.). The original city is nearly deserted, and the present town consists of houses scattered about its remains, and interspersed with fields, gardens, and groves. There are some remains of fine mosques. The ruin of the ancient town began with its sack by the Mahrattas about 1742, and was completed by famine some years later. Pop. according to census (1891) 44,295.

BAHIA, *bá-ē'á*: cap. of the Brazilian province of the same name; otherwise called San Salvador—the more usual term being taken from *Bahia de Todos-os-Santos*, or *Bay of All Saints*, on which it is situated; lat. 13° 1' s., long. 38° 32' w. B. has an exchange, arsenal, and imperial dock-yard, besides many ecclesiastical and public institutions; and is the point of departure for a railway line. It is connected by submarine telegraph with Pernambuco, Para, and Rio. The value of imports of foreign goods into B., in 1874, was \$7,279,925; exports in the same year, \$6,921,745. The chief exports of B. are sugar, cotton, coffee, tobacco, rice, rum, dye-stuffs, fancy woods, cocoa-nuts, horns, hides, diamonds, and bullion; and it imports manufactured goods, provisions, flour, salt, iron, glass, and wines. B. is the oldest city in Brazil, having been founded by the first cap. gen. of the country, and was long the cap. of the colony. As a port, B. is unsurpassed. Pop. (1890) 174,412 nearly equally divided into whites, blacks, and mulattoes.

BAHIA: province of Brazil, about the middle of the coast, taking its name from its chief city: s. lat. from 10° to 16° w. long. from 37° to 44°. The wealth of B., con-

BAHIA HONDA—BAHRDT.

sisting in valuable timber, in rich mines of gold, silver, copper, lead, iron, in deposits of potash, alum, etc., is in great measure lost for want of good roads. The interior contains lofty sierras; but the maritime districts are fertile, being well watered by the Itapicuru, Contas, and other rivers. Besides the streams that flow through B., the San Francisco, a vastly larger river, forms about half of the inland boundary, dividing this province from that of Pernambuco. Pop. (1888) 1,821,089.

BAHIA HONDA, *bâ-ê'â ôn-dâ*: a harbor on the n. coast of Cuba, 60 m. w.s.w. of Havana; protected by a fort, and formerly much resorted to by privateers and slavers.

BAHNASA, *bâ-nâ'sâ* or **BEHNESEH**, *bě-ně'sě*: town of central Egypt, on the Bahr Yousef (Joseph's Canal); noteworthy as the site of the ancient *Oxyrynchus*, celebrated for its numerous monasteries, the ruins of which are still seen.

BAHR, *bâr*: Arabic word signifying a large body of water, applied to lakes and rivers—**BAHR-EL-ABIAD** (the White river) and **BAHR-EL-AZRAK** (the Blue river) are the chief branches of the Nile (q.v.).—**BAHR-ASSAL** is Lake Assal (q.v.).—**BAHR-BELA-MA** (the Sea without Water), a long, deep valley in the desert, west from Cairo. It is completely barren, but has the appearance of having been once a water-course.

BÄHR, *bâr*, **JOHANN CHRISTIAN FELIX**: eminent German philologist and critic: 1798–1872, Nov. 27; b. Darmstadt. He was educated at Heidelberg, where he gained the friendship of Creuzer, whose symbolic system of interpretation in mythological matters he pursued at a later period. He was elected a professor in 1826, having published an annotated edition of *Alcibiades* (Heid. 1822), and of *Philopoemen*, *Flaminius*, *Pyrrhus* (Leip. 1826); also the fragments of Ctesias. But a greater interest was excited by his *History of Roman Literature* (1828), noted for clearness and comprehensiveness. Three supplements to this work appeared: *The Christian Poets and Historians of Rome* (1836), *The Christian-Roman Theology* (1837), and the *History of Roman Literature in the Carolingian Period* (1840). One of his most important works is his version of Herodotus (1832–35). In 1835, he published his *De Universitate Constantinopoli Quinto Sæculo Conditâ*. He contributed numerous articles to Jahn's *Jahrbücher für Philologie*, and other works.

BAHRDT, *bârt*, **KARL FRIEDRICH**: a German theologian of the extreme sceptical school: 1741–92, Apr. 23; b. Bischofswerda, Saxony; d. Halle. He studied at Leipsic, where he showed extraordinary talents, and a restless disposition. His early theological writings indicated his sceptical tendencies. On account of his immoral conduct, he was, 1768, compelled to leave Leipsic, where he had been a popular preacher. In Erfurt, his next residence, he was appointed prof. of philosophy and Hebrew antiquities, and wrote *Letters on a Systematic Theology*, and *Aspirations of a Mute Patriot*, two works whose heterodoxy

BAHREIN ISLANDS—BAIÆ.

involved him in controversies, and made his position untenable. In 1771 he went to Giessen, where he delivered theological lectures, and preached with approbation. His translation of the New Test. was regarded as so dangerous, that the author was deprived of the privilege of teaching. His creed, in fact, was simple Deism, rejecting miracles and not maintaining the immortality of the soul. Ultimately, he was reduced to the position of a tavern-keeper; and as he still persevered in his attacks on orthodoxy, he was imprisoned for one year at Magdeburg, where he wrote an autobiography. Among his works are —*The Religious Edict* (a satire on the Prussian religious edict of 1788), and *The German Union*.

BAHREIN ISLANDS, *bâ-rân'*, or AVÂL ISLANDS: group of islands in the Persian Gulf. The most important is Bahrein, or Avâl, about 27 m. long, 10 broad; hilly in the centre, but fertile, producing dates, figs, and other eastern fruit, besides wheat and barley. Bahrein is badly cultivated. Spring-water is plentiful in the interior, but on the coast it can be procured only from the bottom of the sea, where it springs quite fresh, and is brought up by divers in skins. Manama, the cap., lat. $26^{\circ} 12'$ n., long. $50^{\circ} 39'$ e., has a good harbor on the n., and a safer, though smaller one on the s. The Bahrein Islands are remarkable chiefly for their pearl fisheries, known in ancient times, which employ, during the season, from 2,000 to 3,000 boats, each manned with from 8 to 20 men. The annual value of the pearls is estimated at from \$1,000,000 — \$1,500,000. Tortoise-shell, shark-fins, and dates are articles of export. The islands, which have been subject to many political changes, are now inhabited by Arabs. Pop. 68,000.

BAIÆ, *bâ'yê*: small town of antiquity, on the coast of Campania, 10 m. w. of Naples, where the present castle of Baja stands. When the Roman empire was in its greatest splendor, the beauty of the situation and scenery, and the excellence of the mineral springs of B. made it such a favorite resort of the Roman nobles, that for want of space for their baths and villas they encroached on the sea. Julius Cæsar, Piso, Pompey, Marius, Julia Mammæa, and others, had country-houses at Baiæ. Horace preferred B. to all other places in the world. Seneca warned every one who desired to maintain dominion over his passions, to avoid this watering-place. Cicero thought it necessary to excuse himself for undertaking the defense of Marcus Cœlius, a man who had often visited B, for B. was considered by the stricter moralists of those times the abode of voluptuousness and luxury, and a den of vice. The ruins, still standing on the desolate coast, or rising from the sea, are now the only evidence of the former magnificence of B. The ruins of three supposed temples—one of Venus, one of Mercury, and one of Diana Lucifera—as well as the remains of a few *thermæ*, or warm baths, still attract the attention of archæologists. The harbor, one of the largest belonging to the Romans, is now nearly

BAIERITE—BAIL.

destroyed. The surrounding country is covered with the ruins of Roman villas, sepulchral monuments, and other buildings. Pop., dwelling in mean hovels, 800.

BAIERITE, n. *bī'ér-īt*, or **BAIERINE**, *bī'ér-īn* [*Bayern*, or *Bairen*, the German name of Bavaria]: a mineral, the same as Columbite.

BAIKAL, *bī'kāl* [in Turkish, *Bei-kul*, i.e. Rich Lake]: after the Caspian Sea and the Sea of Aral, the largest lake of Asia. It is a fresh-water lake, in the s. of Siberia, in the govt. of Irkutsk, near the great military road between Moscow, Kiachta, and the mines of Nertschinsk: lat. 51° 20' to 55° 30' n., long. 103° to 110° e. It somewhat resembles a sickle in shape, and varies considerably in breadth. Between the mouths of the Selenga and the Buguldeicha, it is only 19 m. across. Its length is 387 m. and its breadth 9½ to 50 m.; height above the sea, 1,338 ft.; depth at s.w. end, 682 fathoms. The Baikal Mountains, a spur of the Altaï, enclose the lake, which is fed by numerous streams, the chief of which are the Selenga and Bargusin. Its outlet is by the Lower Angara, a chief tributary of the Yenisei; but the river is inconsiderable in size compared with those which flow into the lake. It has several islands, the largest of which, Olkon, has a length of 32 m. B., which forms an important link in the chain of communication between Russia and China, has two commercial ports, and since 1846, steamboats have given considerable impetus to its trade. Its sturgeon and seal fisheries are valuable, and large quantities of a fish resembling a herring are caught in it. A peculiar fish, called the golomyinka (*Callionymus Baicalensis*), almost one mass of fat, yielding fine train-oil, was formerly caught in immense numbers, but is now scarce. The surface of the lake is frozen from Nov. to Apr., but traffic is carried on over the ice. Besides the Russians settled on the banks of the Selenga and Angara, the shores of Lake B. are inhabited by tribes of the Burates and Tunguses.

BAIKALITE, n. *bā'kāl-īt*: a dingy, green crystalline variety of sahlite, found at the mouth of one of the rivers that fall into Lake Baikal, Siberia. **BAIKERITE**, n. *bā'kér-īt*, a chocolate-brown-colored mineral wax.

BAIL, v. *bāl* [OF. *bailler*, to keep in custody—from L. *bājūlārē*, to bear a burden: F. *bail*, a giving over, a granting: It. *balia*, power—from L. *ba'jūlus*, a bearer, generally with authority]: to release from a burden or imprisonment; to set free; to liberate on the security of another; to lave out or free from water (see **BALE** 2): N. surety for another. **BAIL'ING**, imp. **BAILED**, pp. *bāld*. **BAILABLE**, a. *bāl'ā'-bl*, that may be bailed. **BAIL'BOND**, n. a written security given for the appearance of a prisoner to take his trial. **BAIL'PIECE**, n. the slip of parchment on which are recorded the obligations under which those bailing an accused person come before he is surrendered to their custody. **BAIL'MENT**, n. delivery of goods in trust. **BAILEE**, n. *bāl-ē'*, he to whom goods are delivered in trust or on bail.

BAIL.

BAIL'ER, or BAIL'OR, n. one who entrusts another with goods for a specific purpose.

BAIL, n. *bāl* [Dutch *bailie*, a bar, a tub]: the handle of a kettle or a similar vessel; a certain limit within a forest; a division between the stalls of a stable; *pl.*, hoops to bear up the tilt of a boat.

BAIL: a technical term in the practice of the law. By B. is understood the security offered by sufficient sureties and officially accepted for the appearance in court on a day, and at a place certain, of a person arrested or imprisoned, and who, in consequence of such security or B., is in the mean time set at liberty. One who gives security for another is also known as his B. Such security involves the assumption of the custody of the arrested or imprisoned party by his B., the meaning of the rule being that the party arrested or imprisoned is delivered into the hands of those who bind themselves for his forthcoming, in order that he may be protected from prison until he has to make his personal appearance; and, in this sense it differed from the old term, *mainprize*, now obsolete, and which signified a mere security without any other or corresponding guarantee, as in the case of bail. A technical and necessary distinction is taken in law-books between what is called *common B.* or *B. to render to prison*, and *special B.*, or *B. to the action*.

As to those who may or may not be B., it appears, from the nature of the security undertaken, that persons privileged from arrest cannot be B., because the engagement on the part of the B. being, in default of the principal party, to pay the debt or damages and costs, the plaintiff is entitled to require the security of persons who are amenable to the ordinary process of the courts. The possession of *leasehold* property is not enough, unless the party is also a housekeeper; but the real owner of a *freehold* estate, however small it may be, within the jurisdiction of the court, provided he can otherwise make up the amount required, is qualified, though he be only a lodger, or merely an occupant by sufferance in the house of another.

B. in Error: it is provided that proceedings in error shall not stay or delay execution on a judgment, unless the person alleging or pleading such error shall be bound, along with two sufficient sureties, in double the sum recovered by the judgment, in order to prosecute the proceedings in error with effect, and make payment of the costs, in the event of the judgment being affirmed, or the proceedings in error being discontinued. *B. in Attachment*, signifies the sureties required for a party arrested upon a writ of attachment, and brought up before a judge in order to obtain his discharge from custody, the sureties undertaking that he shall appear and answer such interrogatories as may be required of him.

In criminal procedure, it is provided that if the justice or justices, before whom a prisoner is brought, shall be of opinion that the evidence against the prisoner be sufficient, or even if it raise a strong or probable presumption of his

BAIL COURT—BAILEY.

guilt, they shall either commit him to prison, or admit him to B.—that is, allow him to be discharged on entering into a recognizance—with some sufficient surety or sureties—to appear and surrender himself to custody, to take his trial on such indictment as may be found against him, in respect of the charge in question. In all cases of arrest in civil action, B. may be given. In criminal action, the acceptance or the rejection of B., even in cases of high crime, is left largely to the discretion of the court.

In the *civil* process of the Scotch courts, the term corresponding to B. is CAUTION (q.v.).

BAIL COURT, in English Law: formerly a supplementary tribunal at Westminster; in which any one of the judges of the three courts of common law could hold court apart from the others under certain conditions and for certain purposes: see Lush's *Practice* by Stephen.

BAILEE': see BAILMENT.

BAILÉN, or BAYLEN, *bī-lēn'*: town Spain, 24 m. n.n.e. of Jaen. It corresponds to anc. Bæcula, where Scipio won victories over Hasdrubal, Mago, and Masinissa, B.C. 209 and 206. Here in 1212 was the great battle of Navas de Tolosa, where Alfonso VIII. is said to have slain 200,000 Moors, losing but 25 Christians. 1808, July 23, the French gen. Dupont signed the capitulation of B., delivering to the Spaniards 17,000 prisoners, after a bloody conflict of several days. The town has nothing of note save the ruins of a castle. It has manufactures of linen, glass, tiles, etc. Pop. 10,041.

BAILEY, *n.* *bāl-ī* [mid. L. *baillēum*, a species of rampart, a space fortified with stakes: L. *vallum*, a rampart]: the whole space enclosed within the external walls of a castle, or fortress, with the exception of that covered by the keep. This space was variously disposed of, and differed greatly in extent. Sometimes it consisted of several courts, divided from each other by embattled walls, so as to form a series of fortifications. When these courts were two in number, they were known as the outer and inner bailey. The entrance to the B. was generally by a drawbridge over the ditch, and through a strong machicolated and embattled gate. The B. was often like a village, of great extent, containing the barracks for the soldiers, lodgings for workmen and artificers, magazines, wells, chapels, and sometimes even a monastery. In towns, the B. had even a wider signification, and was often retained after the castle or keep had long disappeared, as in case of the Old B. in London, and the B. in Oxford. *Old Bailey*, a prison in London [Gael. *baile*, a town, a village], may mean simply the 'old village' or 'town.'

BAILEY, *bā'ī*, GAMALIEL, M.D.: 1807, Dec. 3—1859, June 5; b. Mount Holly, N. J. He studied medicine in Philadelphia, received his degree 1828, and sailed as ship's doctor to China. He began his work as a journalist with the *Methodist Protestant*, Baltimore; but 1831 removed to Cincinnati, serving as hospital doctor during the cholera season. In 1836, with James G. Birney, he

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established the Cincinnati *Philanthropist*, an anti-slavery journal, becoming sole editor 1837. His office was thrice sacked by a mob in 1837-41, but he issued the paper till 1844, when he went to Washington, D. C., to direct the publication of the *National Era*, in which *Uncle Tom's Cabin* originally appeared. He died at sea, on a voyage to Europe for health.

BAILEY, JACOB WHITMAN: 1811, Apr. 29—1857, Feb. 26; b. Ward (Auburn), Mass. After attending the common schools at Providence, R. I., he studied at West Point, graduating 1832. Being appointed lieut. of artillery, he served in S. C. and Va. He was asst., acting, and full prof. of chemistry, mineralogy, and geology at West Point from 1834 till his death. His scientific reputation rests mainly on his researches in microscopy, in which investigation he is the pioneer in the United States. He was a member of many scientific associations in the United States and England. He died at West Point.

BAILEY, JAMES MONTGOMERY: author: b. Albany, N. Y., 1841, Sep. 25. He was educated at the common schools, and in early life was a carpenter, working at his trade in Danbury, Conn., 1860. At the outbreak of the civil war, he enlisted in the 17th Conn. regt., and served till the close of the war. Having been an occasional contributor to the newspapers, he purchased in 1865 the *Danbury Times*, and ran it until 1870, when he consolidated it with the *Jeffersonian*, under the name of *The Danbury News*. In this paper he made his reputation as 'the *Danbury News Man*,' through his humorous ability in writing short descriptive articles, which became very popular and were copied extensively into the newspapers through the United States. By 1870 the circulation of his paper had increased to 30,000 copies. In 1874 he visited Europe for his health. His published works include: *Life in Danbury* (1873); *The Danbury News Man's Almanac*; *England from a Back Window* (1878); *They All Do It* (1877); *Mr. Phillips's Goneness* (1879); and *The Danbury Boom* (1889). He d. 1894, Mar. 4.

BAILEY, JOSEPH: farmer and soldier: 1827, Apr. 28—1867, Mar. 21; b. Salem, O. He served as capt. in the expedition against New Orleans 1862, and was promoted to major and lieut. col. 1863. In 1864 his remarkable engineering feat of building a dam in the Red River, which deepened the channel, saved the Mississippi squadron, which was shut up by low water. He was appointed brig.-gen., and after the war settled in Newton co., Mo., as a farmer, was elected sheriff, and was murdered while performing an official duty.

BAILEY (or BAILY), NATHANAEL, or NATHAN: eminent English philologist and lexicographer: died 1742. His *Etymological English Dictionary*, pub. about 1721, was the foundation of Johnson's great work, and is still worthy of consultation. B. had a school at Stepney, near London, and published several educational works.

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BAILEY, *bā'li*, PHILIP JAMES: distinguished English poet: b. Basford, in the vicinity of Nottingham, 1816, Apr. 22. He entered the Univ. of Glasgow, 1831, and was called to the English bar 1840, but never practiced. The first edition of *Festus*, the poem by which he is best known, published 1839, has in subsequent editions received much new matter. It attracted considerable notice in England, and in America almost a tornado of applause. While the enthusiasm lasted, B. was in certain quarters mentioned in the same breath with Shakespeare, Milton, and Goethe. By reason of this injudicious admiration, more injurious than even unmerited censure, writers in literary journals have frequently been stirred up to speak of *Festus* with a contempt which it is far from deserving. It is a wonderful work, when the age of its author is taken into account. It was begun before the author had reached his 20th year, and completed in three years. *Festus* errs from excess of boldness. Mr. B. speaks of universes as other poets speak of buttercups. He had the *entrée* to the highest heaven and to the regions of penal fire. He is on terms of perfect familiarity with Eternity. He laid his scenes in the 'Centre,' 'Elsewhere,' 'Everywhere,' 'Nowhere.' Despite its extravagance, *Festus* is full of poetical thought and felicitous expression, and has occasional dashes of grim humor, not unworthy of Goethe's mocking fiend himself. The faults of the poem are as great as the beauties; there is total lack of congruity or proportion; the reader lays it down with an admiration qualified with disgust. In 1850, Mr. B. published the *Angel World*, with all the faults and all the beauties of the former work on a reduced scale: it is now incorporated with the larger work. Mr. B's subsequent writings were the *Mystic*, the *Age*, a colloquial satire, and the *Universal Hymn* (1867). The first production is in the writer's early style, with all the beauties deleted. But whatever measure of success attended Mr. B. in 'Elsewhere' and 'Nowhere,' failure befell him when he dealt with mankind and the ordinary affairs of earth. He died 1902, Sept. 6.

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BAILEY, SAMUEL. 1791–1870, Jan. 18; b. Sheffield, Eng.: writer on politics, political economy, mental philosophy, and other subjects. He became a banker in his native town, and at his death left £90,000 as a bequest to the town. His works are: *Essays on the Pursuit of Truth and on the Progress of Knowledge* (1821); *Questions for Discussion in Politics, Political Economy, and other Departments of Knowledge* (1823); *A Critical Dissertation on the Nature, Measures, and Causes of Value* (1825); *A Letter to a Political Economist, occasioned by an Article in the Westminster Review on the Subject of Value* (1826); *Essays on the Formation and Publication of Opinions* (1829)—a sequel to his work on the *Pursuit of Truth*; *A Discussion of Parliamentary Reform* (1831); *The Rationale of Political Representation* (1835); *The Right of Primogeniture Examined* (1837); *Money and its Vicissitudes in Value* (1837); *A Defence of Joint-stock Banks and Country Issues* (1840); *A Review of Berkeley's Theory of Vision* (1842), *A Letter to a Philosopher in Reply to some Recent Attempts to vindicate Berkeley's Theory of Vision* (1843); *The Theory of Reasoning* (1851); *Discourses on Various Subjects, Literary and Philosophical* (1852); *Letters on the Philosophy of the Human Mind* (three series, 1855, '58, '63); *On the Received Text of Shakespeare's Dramatic Writings, and its Improvement* (2 vols. 1862, '66).

Mr. B.'s works on the *Pursuit of Truth* and the *Publication of Opinions* gave impetus to liberal views. His writings generally are distinguished by independent thinking, logical precision, a careful English style, and a reformatory aspiration. In mental science he was of the school of Locke, in ethics he accepted the doctrine of Utility.

BAILEY, THEODORUS: 1805, Apr. 12—1877, Dec. 10; b. Chateaugay, N. Y. He entered the navy as midshipman 1818, Jan. 1, becoming lieut. 1827, March 3, commander 1849, capt. 1855, com. 1862, and rear-admiral 1866. He was engaged in the capture of slavers on the African coast 1820–1; twice sailed around the world, on the *Vincennes* 1833–36, and again on the frigate *Constellation*. He served on the w. coast of Mexico during the Mexican war, and during part of 1861–2 commanded the frigate *Colorado* of the Gulf blockading squadron. 1862, Apr. 24, as second in command of Farragut's fleet, he led the right column in the passage of Forts St. Philip and Jackson, and commanded the fleet at the capture of New Orleans, on which occasion he showed signal gallantry and ability. Admiral Farragut complimented him by detailing him to officially demand the surrender of the city of New Orleans, and by making him the bearer of dispatches to Washington announcing the victory. He was placed on the retired list 1866, Oct. 10.

BAILIE, or BAILLIE, n. *bāl'ī* [F. *baillie*, an ambassador: Gael. *baile*, a village, a town]: a Scotch term, with several legal applications; but chiefly and popularly signifying a superior officer or magistrate of a municipal corporation in Scotland, with judicial authority within the city or burgh. In royal burghs, the office is in some respects

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analogous to that of Alderman in England. The chief magistrate of a Scotch corporation, called the *Provost* (q. v.), and often one or more of the bailies, are, in virtue of their office, in the commission of the peace; and bailies are exempted from serving on juries. There are also *Bailies of Regality* and *Barony*, appointed by the *Superior* or overlord of the manor (q. v.), with limited powers. There is a B. for the Sanctuary or Abbey of Holyrood, appointed by the Duke of Hamilton as hereditary keeper, and having jurisdiction within the precincts. See ABBEY: SANCTUARY. The word B. was also formerly a term in the practice of Scotch conveyancing, signifying an officer who represented the seller; the office of B. in this sense is abolished. See BAILIFF. BAILIARY, *bāl'ī-a-rī* the extent of a bailie's jurisdiction.

BAILIFF, n. *bāl'īf* [OF. *baillif*—from *bailler*, to keep in custody: F. *bailli*, a bailiff. See BAIL. BAILIE in Scotch, BAILLI in French, and BALIO in Ital., are terms having a common origin—namely, the middle Latin *ballivus*, connected with the older form, *bagabus* or *bajulus*]: one intrusted to execute power on behalf of another; an officer of justice; an agent or steward over land: always an officer exercising superintendence on behalf of some superior authority. At the Greek imperial court in Constantinople, the chief tutor of the imperial children was called Bajulos. The same title seems also to have been given in Constantinople to the superintendent of the foreign merchants, who was appointed by the Venetians, and it may possibly be for this reason that the title Balio came at length to be applied also to the Venetian ambassadors themselves. The title Ballivus was introduced by the Knights of St. John into the s. and w. of Europe, as the eight members of their chapter were called *Ballivi conventuales*, whence also the name Ballei, given to the circles into which the possessions of the order were divided. In France, the royal Baillis were at one time commanders of the troops, administrators of the royal domains, and judges each in his district. In later times, the royal Baillis were deprived of the two latter offices, and were consequently then called Baillis d'Epée only. Proprietors of estates, also, possessing supreme jurisdiction, appointed Baillis to superintend these courts of justice. As very little knowledge was required for these situations, and as they might be purchased, they were held in little estimation; and in later times, the Baillis became standing characters on the stage, held up to ridicule on account of their ignorance and their absurd pretensions, as well as for cheating and injustice. In England, the name B. was introduced in the reign of William I., to designate the superintendents of counties, which were called Ballivæ. BAILIWICK, n., *bāl'ī-wīk*, [F. and AS. *wic*; Goth. *veih̄s*;—L. *vīcus*, a village or town]: the limits of a bailii's authority or jurisdiction. Blackstone says that the word was introduced by the princes of the Norman line in imitation of the French, whose territory was divided into bailiwicks as that of England into counties.

BAILIFF, HIGH—BAILLIE.

BAILIFF, in English Law, is a legal officer; the keeper, protector, or superintendent of some duty or charge legally imposed. As officers of the law, bailiffs put in force arresting process, and they perform other duties within the county or bailiwick required of them by the sheriff, who is their immediate official superior.

The sheriff himself is the *Queen's B.*, and, as such, it is his business to preserve the rights of the Crown within his bailiwick. In the United States the term is rare, but sometimes used to signify a sheriff's officer or constable; or one accountable for rents and profits of real estate.

BAILIFF, HIGH: see HIGH BAILIFF.

BAILLEUL, *bī yū'*: town of France, dept. of the Nord; with manufactures of woollens, cottons, lace, hats, beet-root sugar, etc.—the cheese of its neighborhood being also celebrated. Pop. 8,000.

BAILLIE: see BAILIE.

BAILLIE, *bā'le*, JOANNA: poetess: 1762, Sep. 11—1851 Feb. 23; b. Bothwell, Lanarkshire, Scotland, dau. of a Presbyterian clergyman. She received a superior education, and went to reside in London with her brother, Matthew; a physician. Here she remained till her death, at the age of 89. Her life was singularly happy, but devoid of striking incident. She had the esteem and affection of all her literary contemporaries, and general popular appreciation. Her greatest achievement is the *Plays on the Passions*, which, though erroneous in conception, are full of noble and impressive poetry, with frequent touches of intense dramatic power. The principle upon which Miss B. proceeded in the construction of these works, was to take a single passion as the subject of a play, and to exhibit its influence on an individual supposed to be actuated by nothing else. In fact, such persons do not exist; men are swayed by a variety of conflicting emotions; and even when any one of these becomes dominant, it does not destroy the rest, otherwise every victim of a ruling passion would lapse into a monomaniac. The leading personages of Miss B.'s plays are, therefore, rather impersonations of certain elements of human nature, than genuine human beings. They are vivid poetical studies in psychology; not mirrors held up to nature, like the brilliant and variegated creations of Shakespeare. Still, there are scenes, in her tragedies especially, where the interest of the reader is so excited by the great art shown in the minute delineation of a particular passion, that he is forced to forgive the artificial theory of the authoress. The first volume of the *Plays of the Passions* appeared 1798, and had remarkable success. Four years afterwards, she published a second vol.; in 1804, *Miscellaneous Plays*; in 1812, the third vol. of her *Plays of the Passions*; in 1836, three vols. of dramatic poetry. The most popular as well as the most powerful of her separate works is the tragedy *De Montfort*. It was brought upon the stage in London, Kemble acting for eleven nights the character of the hero. Many of Miss B.'s minor pieces are very sweet, simple, and beautiful; and are marked by a sprightly grace of versification, and a playful

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serenity of spirit, which reflect the personal character of the authoress.

BAILLIE, MATTHEW, M.D.: 1761, Oct. 27—1823, Sept. 23; b. in the Manse of Shotts, Lanarkshire, Scot.: distinguished physician and anatomist. His father (prof. of divinity in the Univ. of Glasgow) was descended from the family of Baillie of Jerviswood, noted in the history of Scotland during the reign of Charles II.; his mother was a sister of the two celebrated anatomists, William and John Hunter; and one of his sisters was Joanna B., the poetess. He studied in the Univ. of Glasgow, and then in Baliol Coll., Oxford; and, 1780, he commenced his anatomical studies in London under the care of his uncle. At the death of Dr. Hunter, 1783, he was made his successor in the anatomical lectureship, in which he gained high repute. In 1795, he published a small work entitled, *The Morbid Anatomy of some of the most Important Parts of the Human Body*, which as a compendium of information previously scattered, and as offering a multitude of ingenious observations on its special subject, had a remarkable influence on the study of medicine. Its publication has been said to have made an era in medical science. In 1799, Dr. B. relinquished his lectureship, and in 1800, his duties in St. George's hospital, and turned exclusively to the work of a medical practitioner. In one year his professional income is said to have reached \$50,000. In 1810, he was appointed physician to the king, and offered a baronetcy, which he declined.

BAILLIE, ROBERT: one of the most eminent, and perhaps the most moderate, of all the Scottish Presbyterian clergy during the time of the civil war: 1599—1662, July; b. Glasgow: educated at the univ. of that city. In 1622, he received episcopal ordination—episcopacy being then nominally the established religion of the country—from Abp. Law, and was shortly after presented to the parish church of Kilwinning. At first a maintainer of the doctrine of passive obedience, he seems to have changed his opinions on this point during 1630–36. In 1638, he sat in that famous General Assembly of the Kirk of Scotland which met in Glasgow to protest against episcopacy being thrust on an unwilling people, but conducted himself with greater prudence and temperance than was agreeable to his excited brethren. However, he soon threw himself eagerly into the national cause. In 1640, he was selected by the Scottish leaders, on account of his pamphlet against Laud's party, as a proper person to go to London, with other commissioners, to prepare charges against Abp. Laud, whose rash and tyrannical measures were alleged to have been the origin of the recent hostilities against the sovereign. On his return to Scotland, 1642, he was appointed joint prof. of divinity at Glasgow with Mr David Dickson, equally distinguished, but less moderate. In 1643, he was again sent to London as a delegate to the Westminster Assembly of Divines. It is curious to notice, in connection with this incident of his career, that though Mr B. had himself ex

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perienced the injustice of intolerance, like almost every other theologian of his age, he vehemently discarded the principle of toleration, and asserted the divine right of presbytery with as much emphasis as Laud did the divine right of episcopacy. After the execution of Charles I., 1649, B. was chosen by the church to proceed to Holland, and to invite Charles II. to accept the covenant and crown of Scotland. After the Restoration, he was made principal of Glasgow Univ. His *Letters and Journals*, from 1637-62, were edited by David Laing for the Bannatyne Club (3 vols. 1841,2) and formed the subject of a remarkable review by Carlyle, reprinted in his *Miscellanies*.

BAILLIE, ROBERT, of Jerviswood, happily described as the 'Scottish Sydney': b. Lanarkshire; d. 1684, Dec. 24: distinguished himself during the latter part of the reign of Charles II. by his bold opposition to the tyrannical misgovernment of the Duke of Lauderdale. Having on a certain occasion (1676, June) rescued a relative, the Rev. Mr. Kirkton, from the clutches of Abp. Sharpe's principal informer—a wretched profligate of the name of Carstairs, who pretended that he had a warrant for the apprehension of the clergyman, but refused to show it—B. was actually prosecuted for interfering to prevent the illegal capture of his friend. For this purpose, an ante-dated warrant was furnished to Carstairs, signed by nine of the councilors. The Marquis of Athole afterwards admitted to Bp. Burnet that he was one of the nine who lent their names to this infamous document. The case was therefore made out to be a tumult against the government. B. was fined in 6,000 merks (£318). He refused to pay, and was sent to prison; but so strong was the indignation of the Scottish gentry, that he was released at the end of four months, in consideration of payment of one-half of his fine to Carstairs. In 1683, B. was prominent in a scheme of emigration to South Carolina, as he saw no other refuge from the degrading tyranny of the government. About the same time, however, he entered into correspondence with the heads of the new Puritan party in London, whose leaders were Russell, Sydney, and the Duke of Monmouth, and subsequently went to that city to concert measures for a vigorous insurrection against the government, not, however, so far as he was concerned, with a view to revolution, but as the only means of securing adequate reforms. On the discovery of the Rye-house plot, B. was arrested, and sent down to Scotland. Accused of conspiring against the king's life, and of being hostile to monarchical government, B. was tried at Edinburgh, and condemned to death upon evidence at once insignificant and illegal. His bearing both on his trial and during his imprisonment was such that his cousin, Bishop Burnet, declared 'it looked like a reviving of the spirit of the noblest of the old Greeks or Romans, or rather of the primitive Christians and first martyrs', and the celebrated Dr. Owen speaks of him as a 'great spirit,' 'a person of the greatest abilities I almost ever met with.' The sentence was carried into execution 1684, Dec. 24.

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BAILLY, *bā'li*, JEAN SYLVAIN: 1736, Sept. 15—1793, Nov. 11; b. Paris: distinguished French savant, pres. of the national assembly of 1789, and mayor of Paris. Originally intended by his father for an artist, he turned first to literature, then to astronomy. In 1763, B. presented to the Académie des Sciences his *Lunar Observations*; 1766, appeared his *Essay on the Satellites of Jupiter, with Tables of their Motions*; and 1771, a treatise on the light of these satellites, remarkable for the profundity of its astronomical views, and which classed him at once among the greatest astronomers of his time. His historico-scientific works, especially his *History of Indian Astronomy*, while full of learning and ingenuity, and written with great elegance, present speculations now considered fantastic. In 1777, he published his *Letters on the Origin of the Sciences*; and 1799, his *Atlantis of Plato*. In 1784, he was elected a member of the Académie Française; and in the following year, of the Académie des Inscriptions. The *éloges* which he wrote about this period for the Académie des Sciences on Charles V., Molière, Corneille, Lacaille, Leibnitz, Cook, and Gresset, were very highly praised. Fontenelle was the only Frenchman before him who had been honored with membership in the three académies at once. The revolution interrupted his peaceful studies. During the earlier part of it, he had a very prominent position. Elected pres. of the national assembly, 1789, June 17, and mayor of Paris July 15, he officiated with great integrity; lost his popularity by allowing the National Guard to fire on the masses assembled in the Champ de Mars, 1791, July 17, to demand the dethronement of the king. Considering it impossible to satisfy either party, B. withdrew altogether from public affairs, and went to live first at Nantes, afterwards with his friend Laplace at Melun. Here he was seized by the Jacobin soldiery, and brought to Paris, where he was accused of being a royalist conspirator, condemned, and put to death with the usual Jacobin preliminary of savage insult. Among his papers were found, and afterwards published, an *Essay on the Origin of Fables and Ancient Religions* (1799), and *Memoirs of the Revolution by an Eye-witness* (1804).

BAILMENT [from the French word *bailler*, to put in the hands of, to deliver]: in *law*, a delivery of something of a personal nature to one party by another, with the understanding that it is to be held in accord with the purpose or object of the delivery, and to be returned, or delivered over when that purpose or object shall have been accomplished. The party making the first delivery is called the bailor, and the party receiving, the bailee. A delivery of goods in trust, upon a contract, either expressed or implied, that the trust shall be faithfully executed by the bailee, is also a Bailment.

Bailments may be divided into three kinds: First, those for the benefit of the bailor, or some person whom he represents. Second, those for the benefit of the bailee, or some person represented by him. Third, those which are for the benefit of both parties. In regard to the first of these classes, the bailee is required to exercise only slight care of the article

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delivered, and is responsible only for gross neglect. In the second, he is required to exercise great care, and is responsible even for slight neglect. In the third, he is required to exercise ordinary care, and is responsible for ordinary neglect. There is also a supplementary class in which the bailee is responsible for loss even where there is no neglect on his part, and becomes, as it were, with certain exceptions, the insurer of the safety of the thing bailed. When a person receives the goods of another to keep without recompense, and he acts in good faith, keeping them as his own he is not answerable for their loss or injury. As he derives no benefit from the B., he is responsible only for bad faith or gross negligence. This obligation, however, may be enlarged or decreased by a special acceptance, and a spontaneous offer on the part of the bailee increases the amount of care required of him See BORROWING: LOAN: DEPOSITS.

A bank (national or otherwise) accustomed to keep securities, whether authorized by its charter to do so, or not, is liable for their loss by gross carelessness. So when a person receives an article and undertakes gratuitously some commission in respect to it, as to carry it from one place to another, he is only liable for its injury or loss through his gross negligence. It is compliance with the law if he keep or carry it as he does his own property. A borrower, on the other hand, who receives the entire benefit of the B., must use extraordinary diligence in taking care of the thing borrowed, and is responsible for even the slightest neglect. He must apply it only to the purpose for which it was borrowed; he cannot keep it beyond the time agreed; cannot permit any other person to use it; and cannot keep it as a pledge for demands otherwise arising against the bailor. The depositary or mandatory has the right of possession as against everybody but the true owner. The duties and liabilities of common carriers and innkeepers, under the contract implied by law, are regulated upon principles of public policy, and are usually considered by themselves.

BAILS, *n.* *bā'z* [OF. *bailles*, a barricade, a palisade: L. *bācūlus*, a stick]: the small sticks on the top of the wickets in the game of cricket.

BAILY, EDWARD HODGES, R.A.: 1788, March 10—1867, May 22; b. Bristol, Eng.: eminent sculptor. In 1807, he went to London, and entered Flaxman's studio. In 1809, he entered the school of the Royal Acad., and gained the silver and gold medals in rapid succession. He became an academician 1821. His earlier works were chiefly classical figures, careful in execution, simple and pure in conception; but it was not till his twenty-sixth year that his genius manifested itself in his celebrated *Ere at the Fountain*, a figure of exquisite grace and loveliness. His next works were, *Hercules casting Lycus into the Sea*, *Apo'lo Discharging his Arrows*, and *Maternal Love*. George IV. employed him, with other artists, to execute the sculpture in front of Buckingham Palace, the figures on the marble arch, and the *Triumph of Britannia*, and also the *lassi-relievi* that surround the throne-room. Besides these, B. executed a great num

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ber of busts and statues of distinguished contemporaries, such as Telford the engineer, Earl Grey (14 ft. high), and Sir Astley Cooper. The statue of Nelson, in Trafalga. Square, is likewise his work. His *Eve listening to the Voice*, the *Sleeping Nymph*, *Girl preparing for the Bath*, and *The Graces Seated*, are among the finest efforts of his genius.

BAILY, FRANCIS: 1774-1844; b. Newbury, Berks; d. London: eminent English astronomer. In the midst of active business as a London stockbroker, he laid the foundation of his scientific fame, and in later years rendered remarkable services to astronomy, chief among which were his share in the foundation of the Astronomical Soc., and in the improvement of the *Nautical Almanac*, his laborious repetition of Cavendish's pendulum experiments, and the production of the Astronomical Society's Star-catalogue. The latter, says his biographer, Sir J. Herschel, 'put the astronomical world in possession of a power, which may be said, without exaggeration, to have changed the face of sidereal astronomy.' In addition to several standard works on Life-annuities, etc. (1808-13), and an immense mass of contributions to the *Memoirs of the Astronomical Society*, he wrote a valuable *Life of Flamsteed* (1835).

BAILY'S BEADS, in Astron.: a phenomenon in connection with eclipses of the sun, fully described first by Francis Baily (q.v.). Just before the beginning and after the end of the obscuration of the sun's disc by the moon, the thin crescent-shaped unobscured portion of the sun seems usually to become suddenly discontinuous, and looks like a belt of bright points, varying in size and separated by dark spaces. The resulting appearance has been compared to a string of beads. The phenomenon is accounted for most probably as an effect of irradiation. To irradiation it is also due that, by default of the retina of the eye, bright objects seen on a dark ground seem larger than they really are.

BAIN, *bān*, ALEXANDER: b. Aberdeen, Scot., 1818: writer on mental philosophy. He entered Marischal Coll. and Univ. 1836, and graduated 1840. From 1841 to '44, he assisted the prof. of moral philosophy in Marischal Coll., and 1844,5, taught the class of nat. philos. In the winter of 1845,6, he lectured on nat. philos. in the Andersonian Univ., Glasgow. In 1847, he became assistant sec. to the Metropolitan Sanitary Committee, and was thence transferred to the same office in the General Board of Health, which office he resigned 1850. From 1857 to '62, and from 1864 to '69, he was examiner in logic and moral philos. in the Univ. of London. For several years he acted as examiner in mental philos. at the India civil service examinations. In 1860, he became prof. of logic in the Univ. of Aberdeen. He d. 1877, Jan. 2.

Mr. B. began as a writer 1840, contributing to the *Westminster Review*. He contributed also a number of treatises to the publications of W. and R. Chambers, especially in the educational department, among them an edition of the *Moral Philosophy of Paley, with Dissertations and Notes*

BAINBRIDGE.

(1852). In 1855, he brought out *The Senses and the Intellect*, and 1859, *The Emotions and the Will*, completing a system of the human mind. In 1861, appeared *The Study of Character, including an Examination of Phrenology*. In 1863, he published an *English Grammar*, and 1866, a *Manual of English Composition and Rhetoric*. In 1868, appeared his *Mental and Moral Science, a Compendium of Psychology and Ethics*; 1870, *Logic, Deductive and Inductive*; 1872, *A Higher English Grammar* (with a *Companion*, 1874). In 1872, he acted with Prof. Robertson in editing Grote's treatise on *Aristotle*; and he edited Grote's minor works. In 1873, he published the *Relation of Mind and Body*; 1879, *Education as a Science*; 1881, *James Mill, a Biography*, and *John Stuart Mill, a Criticism*.

In 1881, he resigned his chair in Aberdeen, and was elected rector of the univ. B. is remarkable for the subtlety and minuteness of his analysis, and the clearness of his exposition. He belongs decidedly to the empirical or experimental school of philosophy, in opposition to the *a priori*, or transcendental. His chief work, *The Senses and the Intellect*, together with *The Emotions and the Will*, is a complete systematic exposition of the phenomena of the human mind. B.'s psychology is based on physiology, after the manner of Hartley's; but instead of considering the human organism as capable only of receiving impressions and of acting in response thereto, he finds in it a power of originating active impulses (see SPONTANEITY), and thus obviates many of the defects alleged by *a priori* philosophers to inhere in the system of sensationalism, as hitherto exhibited.

BAINBRIDGE, *bān'brīj*, WILLIAM: naval officer: 1774, May 7—1833, July 28; b. Princeton, N. J. He began as a seaman at the age of 15, and in four years was commander of a merchantman. He showed intrepidity and determination in the instance of the impressment of one of his sailors by a British man-of-war; and in 1798 the reconstruction of the American navy gave him his opportunity. He obtained the appointment of lieut.-commander, and was placed in command of the schooner *Retaliation*, and afterward of the 18-gun brig *Norfolk*, and was made master-commander; and in 1800 he was promoted to capt., and given command of the frigate *George Washington*, with which he went to Algiers, his being the first war vessel to fly the American flag in those waters. He next commanded the *Essex* of the Mediterranean squadron 1801, and 1803 was appointed to command the *Philadelphia*, a 44-gun frigate attached to Commodore Preble's squadron, ordered to cruise against the Barbary pirates. The *Philadelphia* ran aground off Tripoli, while chasing a corsair, and was surrendered to a swarm of Tripolitans who attacked her in boats: the following year she was destroyed by Lieut. Stephen Decatur. B. and his 315 men were held prisoners for 19 months, suffering extreme privations and in danger; they were released at the close of the war against Tripoli, 1805, June. B. returned to the United States, and a court of inquiry being held in his case, he was acquitted; but though offered the command of the navy yard at New York, he declined it because of pecu-

BAINES—BAIRAKTAR.

niary embarrassment due to his long imprisonment, and re-entered the merchant service, in which he remained except for a brief period until 1811, when he was made commodore and placed in command of a squadron, including the frigate *Essex*, the sloop-of-war *Hornet*, with the frigate *Constitution* (44 guns) which he personally commanded, and with which he defeated and captured the British frigate *Java* (49 guns) 1812, Dec. 26, off the coast of Brazil. The *Constitution* lost 9 killed, 25 wounded; the *Java* lost 60 killed, 101 wounded. B. was wounded twice during the engagement, and on his return to the United States was enthusiastically received, and was voted a gold medal by congress. In 1815 the United States declared war against Algiers, and B. was placed in command of a large squadron and sent to the Mediterranean, when a peace was soon arranged. B. established at the Boston yard the first naval school in the country, 1817; and commanded at several stations until his death, in Philadelphia.

BAINES, *bānz*, EDWARD: editor: 1774–1848: b. Walton le-Dale, Lancashire, England. [After a grammar-school education, he was apprenticed to a printer in Preston and established himself in Leeds, where, 1801, with the assistance of friends, he bought the *Leeds Mercury*, which he made the organ in the n. of England of liberal and reformatory but independent politics. His course raised the provincial press to new character and power. He was elected to parliament from Leeds 1834, 35, and 37, and resigned 1841, from ill health. He published *History of the Wars of Napoleon*; *History of the County Palatine and Duchy of Lancaster*; *The Reign of George III.*, etc.

BAINI, *bā-ē'nē*, GIUSEPPE: 1775, Oct. 21—1844; b. Rome: one of the most distinguished scientific musicians of modern times. In 1795, he became a singer in the Papal Chapel. The severe gravity and profound science of his compositions contrasted strongly with the careless style and shallow dilettantism of the modern Italian masters. Even more valuable than his compositions are his historical researches. His principal work is his life of Palestrina, with criticism (1828). B. was appointed director of the papal concerts, 1804, and general director of the choir, 1814.

BAIN-MARIE, n. *bān-mār-ī'ē* or *-mār'ē* [*bain*, a corruption of *balnēum*, a bath, and *Marie* or *Mary*, a Jewess, who discovered and employed the method]: a hot sandbath; a hot-water bath in which cooked preparations may be kept hot, without injury to their qualities, until required for the table.

BAIRAKTAR, *bī-rāk-tār'*, more correctly, BAIRAK-DAR, signifying Standard-bearer: title of the energetic Grand Vizier Mustapha: 1755–1808, Nov. He was the son of poor parents; entered the military service at an early age, and soon distinguished himself by his valor. When he was Pacha of Rustchuk, 1806, he withstood the Russian army, which had advanced into Moldavia and Wallachia, and had taken Bucharest. After the revolt of the janizaries, 1807, by which Selim III. (q.v.) was deposed from the throne, in favor of Mustapha IV., B. at first concealed his attachment

BAIRAM—BAIRD.

to the deposed monarch, and marched with his troops apparently against the revolted Servians; but as soon as he reached Adrianople, he compelled the grand vizier to return with him to Constantinople, in order to restore the throne to Sultan Selim. On their return, they found this prince murdered, and his dead body lying in the first court of the seraglio. Filled with rage at this sight, B. caused all those to be put to death who had had share in the murder. He deposed Mustapha IV.; proclaimed the brother of this prince, Mahmoud II., sultan, 1808, July 28; and was appointed grand vizier. In the exercise of this office, he deposed the grand mufti, the leader of the janizaries, and all the ulemas who had taken part in the last revolution; while he was careful to secure the tranquillity of the capital, and strengthened the regular army. His chief object was the annihilation of the janizaries; but, like the unfortunate Selim, he fell a victim to these fierce bands of soldiery, who resisted everything like military discipline. Favored by the fanatical people, the janizaries rebelled, and, with the support of the fleet, attacked the seraglio, 1808, Nov. 15, demanding the restoration of Mustapha IV. B. defended himself bravely; but when he saw that the flames threatened to destroy the palace, and that he was in danger of falling alive into his enemies' hands, he strangled Mustapha, threw his head to the besiegers, and then blew up with gunpowder the palace and himself.

BAIRAM, n. *bî'râm* [Turk.]: a festival among the Turks, celebrated for three days immediately after the fast of Ramazan. See **BETRAM**.

BAIRD, *bärd* or *bärd*, **ABSALOM**: born 1824, Aug. 20, Washington, Penn.: soldier. He graduated at West Point 1849, was promoted first lieut. 1853, and in 1859 was asst. prof. of mathematics at West Point. At the commencement of the civil war, he commanded a battery; was adjt. gen. of a div. in the Manassas campaign; chief of staff of 4th army corps in the Peninsular campaign; commanded a brigade in the Army of the Ohio 1862, and a div. under Rosecrans in Tennessee. He was brevetted maj. gen. of vols. for services at Atlanta, and 1865 maj. gen. U. S. A.

BAIRD, **CHARLES WASHINGTON**, D.D.: 1828, Aug. 28—1887, Feb. 11; b. Princeton, N. J.; son of Robert B., D.D.: clergyman and author. He graduated at the Univ. of the City of N. Y. 1848, and at Union Theol. Seminary 1852; was Amer. chaplain at Rome 1853, and 1854–61 was pastor of a Dutch Ref. Chh. in Brooklyn; from 1861 till his death of the Presb. Chh. at Rye, N. Y. Many of his writings have been published; among them: *A Chapter of Liturgies* (1856); *A Book of Public Prayer* (1857); *Chronicles of a Border Town: a History of Rye, N. Y.* (1871); *History of Bedford Church* (1882); *History of the Huguenot Emigration to America* (1885).

BAIRD, Sir **DAVID**, Bart.: general in the British army 1757, Dec. 6—1829, Aug. 18; b. Newbyth, Scot. He entered the service 1772, and, 1778, sailed to India as capt.

BAIRD.

in the 73d, a Highland regiment. Its name was soon changed to the 71st Highland Light Infantry, and it became one of the most famous regiments in the service. He was soon in a sanguinary war. The English had excited the hostility of Hyder Ali by a gross breach of faith; and 1780, July, the latter burst into the Carnatic at the head of 100,000 men, disciplined and commanded by French officers. Sep. 10, a portion of the English army fell into an ambuscade at Peramboucum, and was cut to pieces. Among the few who remained alive to be taken prisoners was B., whose heroism had startled the French officers who were opposed to him. He was thrown into a dungeon at Seringapatam, where he endured a galling captivity of four years. Released, 1784, July, he became lieut.col. of his regiment, 1791; in 1795, received a colonelcy; in 1798, was raised to maj.gen.; and in 1799 memorably signalized himself at the victorious assault of Seringapatam. He led the storming-party, having obtained that perilous honor at his own urgent request, Col. Wellesley (afterwards Duke of Wellington) commanding the reserve. In requital of his brilliant services, he was presented by the army, through the commander-in-chief, General Harris, with the state-sword of Tippoo Saib, and received the acknowledgments of the home government. On his return to India, considering that undue preference had long been given to Wellesley, and that his own merits were constantly overlooked, B. applied for leave of absence, sailed for Europe 1803, was received at court with great distinction, knighted 1804, June, and made a K.C.B. in Aug. In 1805, he commanded an expedition against the Dutch settlements at the Cape of Good Hope; in 1807, he commanded a division at the siege of Copenhagen; in 1808, was sent to Spain with an army of 10,000 men, to assist Sir John Moore. He distinguished himself in the battle of Corunna, 1809, Jan. 16. Moore having been killed in the action, Sir David succeeded to the chief command, and had the honor of communicating intelligence of the victory to government. On this occasion, he received, for the fourth time, the thanks of parliament, and was created a baronet, afterwards retiring from active service.

BAIRD, HENRY CAREY: publisher: b. Bridesburg, Penn., 1825, Sep. 10; nephew of Henry C. Carey, economist. He entered the publishing-house of Carey & Hart, Philadelphia, 1841, in which he became a partner 1845; and afterward established the firm of H. C. B. & Co., publishers of industrial and economic works. He has written numerous pamphlets on financial subjects.

BAIRD, HENRY MARTYN, PH.D., D.D., LL.D.: educator: b. Philadelphia, 1832, Jan. 17; son of Robert B., D.D. He graduated at the Univ. of the City of New York 1850; studied in Greece, and later pursued a course of theol. in Union and Princeton seminaries; was a tutor in Princeton College 1855-59; and in 1859 became prof. of Greek in the Univ. of the City of New York. He is the author of: *Narrative of a Residence and Travels in*

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Modern Greece (1856); *Life of Robert Baird, D.D.* (1865); and *History of the Rise of the Huguenots* (1879).

BAIRD, SPENCER FULLERTON, LL.D.: 1823, Feb. 3—1887, Aug. 17; b. Reading, Penn.: naturalist. He graduated at Dickinson Coll. 1840; then began the study of nat. science, and became prof. of that dept. in Dickinson Coll. 1845. He became asst. to Prof. Henry at the Smithsonian Inst., 1850, and after Prof. Henry's death became the secretary. He was appointed U. S. commissioner of fish and fisheries 1871, and thereafter devoted much of his time to the duties of that office, while continuing to act as sec. of the Smithsonian Inst. His principal published works are: *Birds of N. America* (1860); *Mammals of N. America* (1859); *Review of Amer. Birds in the Smithsonian Inst.* (1864); *Hist. of N. Amer. Birds* (1874-84). From 1872-78, he edited for Harper & Bros. the *Annual Record of Science and Industry*.

BAIREUTH, or BAYREUTH, *bī'royt*: cap. of the province of Upper Franconia, Bavaria; formerly cap. of the principality of B.; beautifully situated on the Red Mayn, about 126 m. due n. from Munich. Its streets are broad and well paved, interspersed with groves, promenades, fine gardens, and public fountains. Its principal buildings are the old palace, the new palace, containing a gallery of paintings; the mint, opera-house, riding-school, infirmary, and town-hall. A magnificent new opera-house for the performance of Wagner's music, finished 1875, was opened 1876 with a grand representation lasting several days, of a new work by that composer. B.'s chief articles of industry are leather, cottons, woollens, linen, tobacco, parchment, and porcelain. In B. is a monument to Jean Paul Richter, who died here, 1825. Pop. (1900) 29,387.

BAIRN, n. *bärn* [AS. *bearn*: Meso-Goth. and Icel. *barn*, a child]: in *Scot.* and *prov. Eng.*, a child.

BAIT, n. *bāt* [AS. *batan*, to bait a hook: Icel. *beit*: Sw. *bete*, pasture, grazing: Sw. *beta*, food]: any substance put on a hook to entice fish to swallow it; anything to allude or entice; refreshment taken on a journey: V. to allure by food; to give food or drink to a beast on a journey; to refresh with food on a journey. BAIT'ING, imp. BAITED, pp. *bāt'ēd*. TO BAIT A HORSE, to give a horse food and drink, and rest, while on a journey.

BAIT, v. *bāt* [AS. *betan*, to kindle a fire by blowing it up: Icel. *beita*, to set dogs on one, to harness oxen or horses: OF. *abetter*, to incite]: to cause to be worried by dogs; to provoke and harass with the help of others; to attack with violence, as with dogs. BAIT'ING, imp. BAIT'ED, pp. TO BAIT A BEAR OR A BULL, to set dogs on to bite and worry it.

BAITOOL, or BEITOOL, *bī-tól'*: fortified town of British India, in the presidency of Bengal; 50 m. n.e. from Ellichpoor.

BAIZE, n. *bāz* [Dan. *bai*; OF. *baye*; Dut. *baey*, baize:

BAJA—BAJIMONT'S ROLL.

probably *Baiae*, where first made]: a coarse woolen stuff, of an open texture with a long nap.

BAJA, *bá'yá*: market-town of Hungary, in the circle of Bacs, on the Danube; celebrated for its annual swine-fair. Grain and wine, in large quantities, are produced in its neighborhood. Pop. (1890) 19,740.

BA'JAN: see BEJAN.

BAJARDOUR, n. *băj'ar-dôr* [L. *bajulator*]: a bearer of any weight or burden.

BAJAZET, *băj-a zět'*, or BAJASID, *bâ-yâ-zěd'*: Sultan of the Turks: 1347-1403. In 1389, he succeeded his father, Murad I., who fell in battle with the Servians near Kosovo. Immediately on ascending the throne, he followed the fashion of eastern kings, by strangling his younger brother Yakub, lest he should dispute the succession. In three years he conquered Bulgaria, a part of Servia, Macedonia, and Thessaly; he also subdued most of the states of Asia Minor. From the rapidity of his conquests he received the name Ilderim—that is, Lightning. He even blockaded Constantinople itself for ten years, thinking to subdue it by famine. To rescue this city, King Sigismund of Hungary (afterwards Emperor of Germany) with a large army, in which there were 2,000 French nobles under the command of the Duke of Nivey, attacked the city of Nikopolis, Bulgaria, on the Danube. B. hastened to meet him, and gained a decisive victory over the allied Hungarians, Poles, and French, 1396, Sep. 28; and the greater part of the French, through whose impetuosity the battle was lost, were taken prisoners, and nearly all put to death. B. would now have entirely destroyed the Greek empire, if he had not been prevented by Timur (q.v.), who attacked his possessions in Asia Minor, and completely defeated him 1401, June 16, near Angora, cap. of what was anciently called Galatia, on the very spot where Pompey had formerly overthrown Mithridates. B. himself fell into the hands of the conqueror, who treated him with great generosity. The story that he was carried about imprisoned in a cage is without historical foundation. B. died in the camp of Timur, and was succeeded in the government by his son Soliman I. B. made some administrative improvements, and built many mosques.

BAJAZET II., Ottoman Sultan: 1447-1513: son of the Sultan Mohammed II., the conqueror of Constantinople; began to reign 1481. His reign of 32 years was a succession of wars against Hungary, Poland, Venice, Egypt, and Persia. The last years of his reign were much disturbed by disputes between his sons about the succession to the throne. Influenced by the preference shown by the janizaries for his younger son Selim, B. abdicated in his favor, but died before he could reach the place of his voluntary exile. B. was liberal, and fond of pomp and splendor. Many of the most beautiful mosques in Constantinople and Adrianople were built and magnificently decorated by him.

BAJIMONT'S ROLL, *băj'î-mont*: a valuation, according to which the ecclesiastical benefices of Scotland were taxed,

BAJMAK—BAJZA.

from the end of the 13th c. to the Reformation; named from an Italian churchman, Benemund, or Baiamund de Vicci, sent from Rome by the pope about 1276, to collect the tithe, of all the church livings in Scotland, for an expedition to the Holy Land. No complete copy of B. R., in its original shape is now known to exist. Of the *Antiqua Taxatio*, which was superseded by B. R., there are good copies in the handwriting of the 13th c., as far as concerns the benefices in the four dioceses of St. Andrews, Brechin, Aberdeen, and Moray.

BAJMAK, or БАЈМОК, *bǎ'ĕ-mők*: large village of the Austrian empire, Hungary, province of Bacs; 16 m. s.w. of The resienstadt. Pop. (1890) 7,151.

BAJOCCO, or BAIOTTO, *bǎ-yők'ko* (plu. BAJOCCHI): formerly a copper coin in the Papal States, value about one cent. It was 1-100th of the scudo, which was equal to about \$1.03. In the island of Sicily, the Neapolitan *grano*, the 1-100th part of the ducato (= \$0.80), was also called a bajocco.

BAJUREE, n. *bǎj'û-rĕ*, BAJREE, *bǎj'rĕ*, BAJRA, *bǎj'ra*, or BAJURY, *bǎj'û-rĭ* [Mahratta, *bajuree*]: name of a grain extensively cultivated in India.

BAJUS, *bǎ'yŭs*, MICHAEL (properly, De Bay): 1513-89, Dec. 16; b. Melun, France: one of the most distinguished theologians of the Rom. Cath. Church in the 16th c. He studied at Louvain, and became prof. of theology there, 1550. He was at the Council of Trent in 1563 and 1564. He was the founder of a system of theology, based directly on the Bible and the writings of the Fathers, and setting aside the scholastic method. He had studied much the writings of St. Augustine, and confined himself within the circle of ideas held by that Father, whose doctrines of the entire inability of the human will to do good, and the absence of merit in all good works, B. defended against the Jesuits. The assertions that the human will, as long as it is left to its own freedom, can do nothing but sin, and that even the mother of our Lord was not free from original and actual sin, with other such doctrines, drew on him the accusation of heresy, and 76 of his propositions were condemned by a papal bull. B. submitted, but did not give up his doctrines, and still was subjected to persecution. He earned the reputation of great learning, pure manners, and singular modesty. He may be regarded as the predecessor of the Jansenists, who inherited his Augustinian views, at that time termed Bajanism. His writings, mostly polemical, were pub. by Gerberon (2 vols., Cologne, 1696).

BAJZA, *bĭ'zŏĕ*, JOSEPH: Hungarian poet and prose-writer; 1804, Jan. 31-1858, March 4; b. at Szücsi, in Hertes. His Poems (2 vols., Pesth, 1835), earned him a place among the best Hungarian lyric poets. In the *Kritische Blätter*, 1831-36, the *Athenæum*, and the *Figyelmező* (Observer), 1837-43, he exercised a beneficial influence on the rising literature of Hungary by his severe criticism. He materially aided the Hungarian stage, then in its infancy, by translating a collection of Foreign Dramas (1830), and published an

BAKACS—BAKER.

HISTORICAL LIBRARY (from the German) 6 vols., a **MODERN PLUTARCH**, and a **UNIVERSAL HISTORY**, a rather unskilful compilation.

BAKACS, *böb-kötsch'*, **THOMAS**: Hungarian statesman; b. abt. the middle of the 15th c., d. 1521; son of a peasant; held several bishoprics in succession, became chancellor of the kingdom, and finally abp. and cardinal. He preached a crusade against the Turks; which ended in a bloody civil war. At his death he left enormous wealth to his relations.

BAKARGANJ: see **BACKERGUNGE**.

BAKE, *v. bāk* [Icel. *baka*, to warm: Ger. *bähen*, to foment; *backen*, to bake: Dut. *backen*, to warm one's-self; *bakken*, to bake]: to harden by fire or the heat of the sun; to dress food in an oven or by fire. **BAK'ING**, *imp.*: N. the quantity baked at one time. **BAKED**, *pp. bākt*, or **BAKEN**, *pp. bāk'ēn*. **BAK'ER**, *n.* one whose employment is to bake a small portable tin oven. **BAKERY**, *n. bā kēr-ī*, the place where bread is baked; also **BAKE'HOUSE**. **BAKE-MEAT** or **BAKED-MEAT**, *n.* meat baked in an oven; a meat-pie. **BAK'ING-POW'DER**, *n.* a powder consisting of tartaric acid, bicarbonate of soda, and rice or potato flour; a substitute for yeast. **BAKER'S DOZEN**, *n.* thirteen; the number of loaves sometimes formerly given by bakers as a dozen, in order to avoid the penalty for short weight.

BAKE, *bā'kē*, **JOHN**: 1787–1864, Mar. 26; b. Leyden. distinguished classical scholar; became prof. in the univ. there, 1815. He made substantial contributions to the criticism of Cicero and the Attic orators in *Bibliotheca Critica Nova* (5 vols. Leyden, 1825–31), and *Scholica Hypomnemata* (5 vols. 1837–62). His edition of the *De Legibus* of Cicero has high merits; of less value is that of the *De Oratore*.

BAKEL, *ba-kēl'*: chief town of a dist. in the French colony of Senegal, on the left bank of the Senegal river. The neighborhood is low, marshy, and very unhealthy, but fertile. Pop. 2,600.

BAKER, **DAVID JEWETT**: lawyer: 1792, Sep. 7—1869, Aug. 6; b. East Haddam, Conn. Although he was brought up on a farm, he graduated at Hamilton Coll. 1816. He studied law, was admitted to the bar, and began practice in Kaskaskia, Ill. He was made probate judge of Randolph co. He was U. S. senator from Ill. in the 21st congress, 1830–1, and succeeded in carrying a bill through congress authorizing the sale of public lands in 40-acre tracts to actual settlers. He was U. S. dist. atty. for Ill. 1833–41, and afterward resumed the practice of law.

BAKER, **EDWARD DICKENSON**: soldier: 1811, Feb. 24—1861, Oct. 21; b. London, England. He emigrated to the United States at the age of 5 years. Being left an orphan, he worked as a weaver, studying in his spare time. He studied law and was admitted to the bar, settled in Ill., gained repute as an orator, and became a whig member of the legislature 1837, and of congress 1844. On the outbreak of the war with Mexico, he entered the army, and distinguished himself at Cerro Gordo, where he commanded a brigade. He was again a member of congress

BAKER.

1849-51; and removed 1851 from Galena, Ill., to San Francisco. Thence he removed to Or.; was a U. S. senator from that state; and 1861, after advocating the Union in passionate orations, he entered the civil war as a col., and commanded a brigade at the battle of Ball's Bluff, Va., where he was killed.

BAKER, GEORGE AUGUSTUS: artist: 1821-1880, Apr. 2; b. New York; son of an artist. He was early taught to paint miniatures on ivory. He was very successful in securing likeness, and was greatly esteemed as a colorist. He studied 2 years in Europe and returning to New York, opened a studio 1846; was elected a member of the National Acad., and painted many ideal subjects with recognized ability and success.

BAKER, *bā'kēr*, HENRY: 1698-1774, Nov. 25; b. London: naturalist. Successively bookseller and attorney's clerk, he became a Fellow of the Royal Soc., and of the Soc. of Antiquaries in 1740. He contributed many papers to the Transactions of the former soc.; received its Copley gold medal; published two works on the microscope, and a philosophical poem on the *Universe*. He was founder of the Bakerian lectureship.

BAKER, HENRY BROOKS, M.D.: surgeon: b. Brattleborough. Vt., 1837, Dec. 29. He studied medicine at the Univ of Mich. 1861-2, and during the civil war was in the 20th Mich. infantry, a part of the time as asst. surgeon. He graduated at Bellevue Hospital med. coll. 1866, settled in Lansing, Mich., and began practice. Since 1870, he has been connected with the Mich. state board of health, and has edited and published documents issued by the board. B. has a reputation for his knowledge regarding cholera, pneumonia, typhoid fever, and diphtheria; and has contributed on these subjects to American medical transactions. He is a member of several Amer. and foreign scientific bodies.

BAKER, LAFAYETTE C.: chief U. S. secret service: 1826, Oct. 13-1868, July 2; b. Stafford, Genesee co., N. Y. He settled in Mich. 1839, and was active in pioneer work for some years. Having an adventurous disposition, he travelled over the country 1848-61, working as a mechanic in New York, Philadelphia, and San Francisco, and was an active member of the vigilance committee in the latter city 1856. In 1861 he went to New York, and was sent by Gen. Scott on a confidential mission to Richmond, Va., where he was arrested and imprisoned as a spy. He succeeded in returning north, and was made chief of the secret service bureau with almost unlimited authority, in which office his work was of great value. The bureau being transferred to the war dept., B. was commissioned col., and later brig.gen. He published *History of the United States Secret Service* (1868).

BAKER, MOUNT: active volcano in the state of Washington; in the Cascade Range, a continuation of the Rocky Mountains. It is near to the n. boundary of the state. It is in eruption from time to time, and was very active 1880. Its height is given at over 10,500 feet.

BAKER.

BAKER, Sir RICHARD; abt. 1568–1645; b. Kent (or Oxfordshire): author of the *Chronicle of the Kings of England*, a book long esteemed and quoted on all matters of English history by the country gentry. Addison makes his model squire, Sir Roger de Coverley, refer to it frequently. Yet it had many errors, and is now nearly forgotten. B. was educated at Oxford and in 1603 was made a knight. About 1620, he married and settled in Oxfordshire, of which county he was made high sheriff; but he was soon afterwards thrown into the Fleet Prison for debt which his wife's family had contracted, but for which he had become responsible. Here he wrote his *Chronicle*, pub. 1641, besides several pious works of less note. He died in prison, in poverty.

BAKER, Sir SAMUEL WHITE, K.C.B.: African traveller; b. 1821; son of Samuel B., of Thorngrove, Worcestershire. B. was educated as an engineer, and at an early age went to Ceylon, where, led by the love of field-sports, he explored the recesses of the island. In 1854, he published a work entitled *The Rifle and the Hound in Ceylon*; 1855, *Eight Years' Wanderings in Ceylon*. B. afterwards superintended the construction of the railway which connects the Danube across the Dobrudscha with the Black Sea. In 1860, B. married Florence, dau. of F. von Sass, a young Hungarian lady of great talent and enterprise; and in company with her, he undertook a journey of exploration on the Upper Nile. They set out from Cairo, 1861, Apr.; and B. gave attention first to the Atbara and Blue Nile, the chief affluents of the Nile, which descend from the highlands of Abyssinia. In June, he arrived at the course of the Atbara, at that season dry, or marked by only a few stagnant pools. On the 23d, when the Abyssinian rainy season had set in, a noise like distant thunder was heard, and in a few seconds the river-bed had been converted into a torrent 20 ft. deep. Eight days later, it had become a great river, charged with mud, washed from the hills, which it carried down to the Nile, to cause the inundations and mud deposits of Egypt. B. reached Khartoum, 1862, June, and there he had an opportunity of contrasting the Blue and White Nile. He found the former, like the Atbara, to be a mountain torrent, rising and falling with the Abyssinian rains, but always free from deposits of mud. The White Nile did not thus rise and fall, and its water, never pure, had a disagreeable taste of vegetation, showing that it proceeded from lakes and marshes. When B., with his wife, quitted Khartoum to ascend the White Nile, he had in his pay an escort of 90 persons, 29 camels and asses, and three large boats. After passing through a wonderful region of forests and marshes, the travellers reached Gondokoro, a rendezvous of the traders of the interior. They had been there only a fortnight, when they were joined by Speke and Grant, who had penetrated into those regions from the s. Speke and Grant told B. of the Victoria N'yanza, which they had discovered and explored, and that the natives had described to them another great lake, named Luta N'zige, which they had been unable to visit. B. set out to reach it; and after a series of adventures, he and his wife arrived, 1864, March 14, on

BAKER.

the top of lofty cliffs, from which they beheld the vast inland sea, to which B. gave the name Albert N'yanza. In 1869, an expedition for the suppression of slavery in the interior of Africa was organized by the pasha of Egypt, under B.'s command. A large territory was brought under Egyptian authority. B. was succeeded, 1873, by Gordon Pasha. For the withdrawal by Egypt from these southern regions, see EGYPT: GORDON. B. was knighted 1866, and has received many foreign distinctions. In 1866, he published *The Albert N'yanza*; 1871, *The Nile Tributaries of Abyssinia*; 1874, *Ismailia*, an account of his expedition of 1869-73; and *Cyprus as I saw it in* 1879. D. 1893.

BAKER, THOMAS: antiquary: 1656-1740: educated at Cambridge. He was a non-juror, and consequently resigned his rectorship of Long-Newton, 1690; and he lost his fellowship at the accession of George I. He continued, however, to live in his college, St. John's, Cambridge. He wrote *Reflections on Learning*, and made valuable MS. collections on the history of the univ., abt. 40 vols. folio.

BAKER, WILLIAM BLISS: artist: 1859-1886, Nov. 20; b. New York. He entered as an art student at the National Acad. of Design 1876, and remained 4 years, first exhibiting 1879. In 1884 he exhibited his *Woodland Brook*, for which he received the third Hallgarten prize of \$100. Others of his works are: *In the Old Pasture*; *Pleasant Day at Lake George* (1883); *October Morning* (1884); *Solitude* (1885); and *Under the Apple Trees* (1886)—all exhibited at the National Academy.

BAKER, WILLIAM MUMFORD: Presbyterian clergyman: 1825-1883, Aug. 20; b. Washington, D. C. He graduated at Princeton Coll. 1846, studied for the ministry, and settled in Texas. He had charge of Presb. churches in Austin and Galveston 1850-65, when he accepted a call from Zanesville, O.; thence went to Newburyport, Mass.; and 1874 took charge of a Presb. church in South Boston, Mass. While in Texas, B. wrote a work entitled *Inside: A Chronicle of Secession* (published 1865 anonymously), which made a marked impression by its vivid delineation of scenes and conditions under Confederate rule; it appeared originally as a serial in *Harper's Weekly*. Notwithstanding the difficulties of his position in the capital of Texas during the civil war, B. succeeded in holding his church in connection with the Northern Presb. Assembly. Among his works are: *The Virginians in Texas*; *The New Timothy*; *His Majesty Myself*; *Colonel Dunwooddie*; *Blessed Saint Certainty*; *Thirlmore*; besides serials in the *Atlantic Monthly*, *Harper's Monthly*, and other periodicals—including *Mose Evans*, *Carter Quarterman*, and *A Year Worth Living*. His books have had extensive popularity, owing partly to peculiarly original style and plot, and partly to the fidelity of his portrayal of character.

BAKER CITY—BAKER PASHA.

BAKER CITY: city, cap. of Baker co., Or.; on the s. fork of Powder river and on the Union Pacific railroad; 300 m. e. of Salem, 357 m. e. by s. of Portland; elevation 3,300 ft. It is the principal shipping and business point of the co., and the centre of the mining industry for the mineral regions of Grant, Malheur, Union, and Wallowa cos., which lie about it for a radius of 50 m.; also the centre of a vast agricultural and timber region. It contains 5 hotels, 5 churches, public high school (cost \$30,000) and large graded school, 2 Rom. Cath. schools, commercial college, new brick court-house, public hall, opera-house, water supply from artesian wells by Holly system, 2 national banks, and 2 daily and 3 weekly newspapers. The vicinity produces gold, silver, copper, live-stock, wheat, oats, barley, deer, elk, sheep, and fowl; and the city ships wool, hides, grain, and lumber. Pop. (1890) 2,604; (1900) 6,663.

BAKERIES, *bā'kér-ēz*, **ARMY**: apparatus for supplying soldiers in field service with soft or loaf bread—including portable ovens, and if needful grinding machinery. See **BREAD**, **ARMY**: **COOKERY**, **ARMY**.

BAKER PASHA: 1825-1887, Nov. 18; b. Gloucestershire, Eng.: soldier. He served in the British army through the Kafir war 1852-3, and in the Crimea 1855. At the age of 28 yrs. he was col. of hussars. He travelled extensively in Persia, Afghanistan, etc., 1873, and on his return published a book, *Clouds in the East*, which had a great success. He was convicted 1874 of criminal assault on a young woman in a railway carriage, and, after undergoing a term of imprisonment, left England and entered the service of the sultan of Turkey, first as maj.gen. of gendarmerie; later, he commanded a division in the Balkans. He distinguished himself 1882 in the war in the Soudan with Osman Digna, lieut. of the Mahdi. B. P. was author also of *The British Cavalry* (1858), and *Our National Defences* (1860). He contributed to magazines articles on army reform and the employment of cavalry.

BAKEWELL—BAKING.

BAKEWELL, *bāk'wĕl*: small but very ancient town in Derbyshire; on the left bank of the Wye, near its confluence with the Derwent; 24 m. n.n.w. of Derby; on the slope of a hill, amid very beautiful scenery, in a carboniferous limestone tract, and in the vicinity of black marble quarries, and of coal and lead mines. Its chalybeate springs and warm baths are much resorted to. The celebrated Arkwright first established cotton-mills here. On the opposite bank of the Wye are the traces of a castle built by Edward the Elder, 924. B. is now the property of the Duke of Rutland, whose seat is Haddon Hall, two m. from the town. B. is a centre for visiting the fine scenery of North Derbyshire and the Peak; and the streams in the vicinity are much resorted to by anglers. It contains a spacious cruciform church, founded in Saxon times, and showing specimens of ecclesiastical Gothic architecture of three different periods. The special industry of B. is the turning, polishing, and inlaying of the local marble. Pop. (1871) 2,283; (1881) 2,502 (1891) 2,748.

BAKEWELL, **ROBERT**: 1725-95; b. Dishley, county of Leicester; celebrated agriculturist. He does not appear to have written anything upon his favorite subjects, so that his fame rests entirely upon his successful efforts to improve the breed of domestic animals.

BAKHTEGAN, *bāk-tā-gān'*: salt-lake of Persia, province of Farsistan, from which remarkably fine salt is obtained. Its size is variously stated—some writers making it 60 m. in length, with an average breadth of 8 m.; others only 70 m. in circumference.

BAKING: the mode of cooking food in an air-tight, or at least close, chamber or oven. The term is applied also in the manufacture of Bricks (q.v.), Porcelain (q.v.), etc. For the B. of bread, see **BREAD**. The oven attached to kitchen-grates for cooking is simply an iron chamber, with flues for conveying the heated gases of the fire round it. In B., strictly so-called, the oven is kept close, so that the steam and aroma arising from the enclosed substances are confined; but by opening ventilators a current of air is produced, and then these ovens may be used for what is called *oven-roasting*. The rank taste that often characterizes baked dishes is thus avoided. Ovens are now often heated by water, or steam, or gas. Meat for B. is placed in a dish, from the bottom of which it is raised on a wire frame or trivet. In M. Soyer's baking-dish, a wire frame rests on the edge of the dish, and on this potatoes are laid; a trivet, rising above the frame, supports the meat; while the bottom of the dish contains a Yorkshire pudding; the dripping thus falls upon the potatoes and pudding below.

B., although a convenient mode of cooking, is not considered quite as good for many articles of food as **Roasting** (q.v.).

BAKING POWDER—BAKTSHI-SERAI.

BAKING POWDER: agent in the form of a powder, used instead of yeast in raising bread, cakes, etc. The baking powders of commerce consist of sodium bicarbonate, or potassium bicarbonate, mixed with a dry powder (cream of tartar) capable of liberating carbonic acid when the mixture is moistened. A B. P. consisting of cream of tartar and sodium bicarbonate does not keep well, and hence a little of the bicarbonate is often replaced by carbonate of ammonia, and the whole mixed with $\frac{1}{4}$ its weight of starch, which keeps the two principal agents apart.

BAKONY WALD, *bá-kō'nē rált* (Forest of Bakony): densely wooded mountain-range of Hungary, s. of the Danube, dividing the great and little Hungarian plains. Immense herds of swine are annually driven hither to feed upon the mast of the forest. The keepers of these swine furnished those notorious robbers who play so important a part in the ballads of the Hungarian people, and in the imagination of travellers. The saintly King Stephen founded a cloister in the forest, 1030. Only in recent times has this dangerous territory been thoroughly explored. The hills have an average height of 2,000 ft., with quarries of valuable marble, material for considerable export trade.

BAKSHISH, *bák'shēsh*: in the Persian language a *present*; but in the East, in modern times, it has acquired the special signification of gratuity (Ger. *Trinkgeld*), which, however, the orientals do not quietly wait to receive, but demand loudly, and even insolently. Every traveller in Turkey, Egypt, Asia Minor, or Syria, if he receive the smallest service from any one, is immediately reminded by the cry of 'Bakshish, Bakshish,' to pay for the courtesy by a gift of money. Even when the ambassadors to the Supreme Porte obtain an audience from the sultan, or from any of the high dignitaries, they are obliged, by the prompt gift of a B., to avoid a peremptory demand for it on the part of the door-keepers and other servants. By degrees, the B. has been fixed by custom at certain sums.

BAKTSHI-SERAI, *bák'chē-sa-rī*: ('City of the Gardens'): residence of the ancient princes or khans of the Crimea; in a deep limestone valley, not far from the present cap. Simferopol. The city is kept in excellent repair—a striking contrast to the modern towns of the Crimea. It is one of the most singular in Europe. The palace of the ancient khans has been completely restored in the oriental style by the Russian govt. It consists of a great labyrinth of buildings, courts, and gardens, and is situated about the middle of the town, which it divides into two parts. Pop. (1890) 15,644, almost exclusively remnants of the old Tatar inhabitants.

BAKU—BALA BEDS.

BAKU, *bā-kō'*: important seaport of Russian Transcaucasia, on the Apsheron peninsula in the Caspian Sea. Since 1883 it is connected by rail with Tiflis, and so with Poti and Batoum on the Black Sea. The whole soil around B. is impregnated with petroleum, which forms an important branch of its industry. Some of the fountains ignite spontaneously, and this natural phenomenon has caused B. to be esteemed as a holy city by the Parsees or fire-worshippers, many of whom resort to it from very long distances. B., besides its trade in naphtha, exports cotton, silk, opium, saffron, and salt. The Arabian, Masudi, is the first who mentions B., about 943, and he gives an account of a great volcanic mountain in its vicinity, now extinct. B. was ceded by the Persians to the Russians, 1806. Recently there has been a marvellous development of the petroleum trade (see Marvin, *B. the Petrolia of Europe*, 1884). The refuse is used as a substitute for coal in the steamers on the Caspian Sea. The harbor, strongly fortified, is one of the chief stations of the Russian navy in the Caspian, and is also of great importance as a centre of trade. Much shipbuilding is done. Pop. (1839) 86,611; (1897) 112,253.

B. is cap. of a govt. of Russian Transcaucasia, whose pop. (1897) was 789,659.

BALAAM, *bā'lam*, or *bā'la-am*: a prophet prominent in the early history of the Israelites. He is mentioned first in Numbers xxii. 5, where Balak, King of the Moabites, alarmed at the irruption of the chosen people into his territories, is represented as sending messengers to Pethor, in Mesopotamia, the dwelling-place of the seer, to beseech him to come and curse the invaders. The narrative is marked by two peculiarities, which have excited much speculation and controversy. The first is, the admittedly prophetic character of B., notwithstanding that he was a Gentile; the second is, the curious miracle in the case of his ass. With regard to the supernatural powers attributed to B. the prevalent hypothesis is, that he was the last relic of the patriarchal age, during which communion with God was not formally restricted to one race, but diffused more or less among all the Semitic peoples. Some, again, suppose that his knowledge of God, from whom he apparently received miraculous communications, was derived from the traditions of the primitive faith scattered over Mesopotamia by Abraham, Jacob, Laban, etc.; though Hengstenberg conceives that he had been led to renounce idolatry by hearing of the stupendous miracles which attended the exodus of the Israelite from Egypt, anticipating, as a reward for his change of worship, a further insight into futurity, and a greater power over nature. B. has ever been considered a type of those men who prostitute their powers and hold the truth in unrighteousness, receiving the wages thereof.

BALA BEDS, *bā'lá*: local deposit in the neighborhood of Bala, in north Wales, forming a group in the Lower Silurian of Murchison. They consist of a few beds, rarely

BALÆNA—BALAKLAVA.

more than 20 ft. in thickness; chiefly of hard crystalline limestone, alternating with softer argillaceous bands, which decompose more freely, and leave the limestone like a cornice molding, affording a characteristic by which, at a considerable distance, the Bala Beds can be distinguished from the rocks of hard gritty slate above and below. Trilobites and Cystidæ are the predominant fossils of the group. Calcareous beds, containing similar fossils, have been noticed in the Silurian district of the s.e. of Ireland, and referred to this group.

BALÆNA: see WHALE.

BALÆNIDÆ, n. plu. *bǎ-lē'nǐ-dē* [L. *balæna*, a whale; Gr. *phalaina*]: the family of the whalebone whales. BALANITE, n. *bǎl'ă nīt*, fossil shells of the barnacle family.

BALÆNOP'TERA: see RORQUAL.

BALAGHAT DISTRICTS, *bāl-a-gawt'*: large tract of elevated country in the s. of India, 28,669 sq. m.; extending from the rivers Tumbuddra and Krishna in the n. to the furthest extremity of Mysore in the s. Part of the ancient Hindu kingdom of Carnata, it was conquered by the Mohammedans, and fell into the hands of the British on the final overthrow of Tippoo (q.v.). The name Balaghat signifies *Above the Ghauts*.

BALAK: a Mongol word meaning city; sometimes written *Balaksun*. This word is often met with in the names of cities that have been subdued either during Tartarean or Chinese invasions. It is thus that the name of the city of *Cambalu*, of which Marco Polo speaks in his very interesting voyages, ought to be read *Khambalak* (the imperial city) (*khan* means emperor, in all Tartarean and Turkish languages); that is to say, Pekin, capital of eastern and northern China.

BALAKITG: in Kamtchatkan mythology, god of the winds; son of Khout-Know and spouse of Zavina.

BALAKLAVA, *bāl-â-klá'vá*: small port in the s.w. of the Crimea, separated by a rocky peninsula from the harbor of Sebastopol, from which the direct distance is about 6 m. The harbor, with secure anchorage for the largest ships, is perfectly landlocked, the entrance so narrow as scarcely to admit more than one vessel at a time. To the e., overlooking the bay from a rocky eminence, are the ruins of a Genoese fortress. The foundation of the work is excavated into numerous chambers and galleries. It is the *Symbolon Limen* of Strabo; and the present name is supposed by Dr. Clarke to be a corruption of the Genoese *Bella-chiava*, or Fair Haven. This was long the seat of a Greek colony; in the 14th c., it fell into the hands of the Genoese; about the end of the 15th, they were expelled by the Turks; and on the conquest of the Crimea by Catharine II. of Russia, it was made a military station for a regiment of Greeks and Albanians. In 1854, a few days after the battle of Alma, the town was occupied by the British army under Lord Raglan, and during the ensuing campaign, the harbor was the headquarters of the fleet, and the basis of operation of the army. Here were those scenes of mis-

BALAKLEI—BALAMIO.

management and confusion, with the resulting privations and suffering, that have rendered B. a synonym for chaos. A terrible hurricane, 1854, Nov. 14, in which nine vessels were totally destroyed, and several others seriously injured, tended greatly to increase the confusion which incapacity and divided responsibility first occasioned at Balaklava. Soldiers, six miles distant, were dying for want of food, clothing, and medicine, which were hidden hopelessly beyond reach in store-rooms at B., or stowed away in the holds of ships, not permitted to enter the harbor. Transport vessels, for which the country was paying enormous sums of money daily, were kept idle in port with their most anxiously awaited cargoes (for lack of which the troops were perishing by hundreds) unladen, while poor mutilated and dying soldiers lay miserably exposed on the heights for want of ships to convey them to the hospitals at Scutari. The rebuilding of the greater part of the town, the formation of a line of railway between B. and the camp, and certain official investigations in 1855, completely remedied this disgraceful state of things. The date, 1854, Oct. 25, was signalized, on the heights between the town and the Tchernaya, by those unparalleled cavalry charges, the record of which is among the saddest but proudest memories of the British army. See Kinglake's *Invasion of the Crimea* (6 vols., 1863-80), of which nearly the whole of the fourth vol. is occupied in a minute account of the events connected with B. Pop. (1880) 700.

BALAKLEI: Sultan and Prince of a Tartarean nation, in the beginning of the 13th c. Having conquered a certain territory in 1221, at a time when the dukes of Russia were carrying on intestine war, he sent ambassadors into Lithuania to exact a tribute; but the Lithuanians cut off their ears and noses, and sent them back to their master. Thereupon the Russians and Lithuanians combined their forces, and vanquished B. in the battle of Koidanowa.

BALAMBANGAN, *bâ-lâm-bâng-gân'*: an uninhabited island in Malaysia at the n. extremity of Borneo. At two different times (1774 and 1803) the English made attempts to establish themselves upon this island, but were driven away by the Soolooans.

BALAMIO, *bâ-lâ-mê'ō*, or **BAL'AMY**, **FERDINAND**: 16th c.; b. Sicily: physician to Pope Leo X. He cultivated a taste for poetry and ancient languages, and translated into Latin several treatises of Galen, since united with the Venice edition (1586).

BALANCE.

BALANCE, n. *băl'ăns* [F. *balance*—from mid. L. and It. *bilanciŭ*; Sp. *ba'anza*—from L. *bis*, double; *lancem*, a dish], a pair of scales, consisting of a dish suspended from each end of a beam or lever; equality of weights, power, or force; the difference between the debtor and creditor side of an account; overplus; a sign of the zodiac—also called *Libra*; the sum due on an account: V. to make equal; to settle; to regulate and adjust; to have equal weight, power, or influence; to hesitate. **BAL'ANCING**, imp. **BALANCED**, pp. *băl'ănst*. **BAL'ANCER**, n. one who; *pl.*, in *entom.*, drum-stick-like processes seen in the fly and other dipterous insects. **BALANCE OF POWER**, in *politics*, the endeavor not to permit any nation to have such a preponderating power as to endanger the peace or independence of the others. **BALANCE OF TRADE**, the difference in money-value between the imports and exports of a nation. **BALANCE-WHEEL**, a regulating apparatus used in a watch instead of a pendulum. **BALANCE-FISH**, n. name sometimes given to a shark of the genus *Zygænă*. Their more common appellation is *Hammer-headed sharks*.

BAL'ANCE: instrument for ascertaining the weight of bodies in grains, ounces, pounds, or any other units of weight. The ordinary B. consists of a lever called a beam, whose point of support is in the middle of its length, and having dishes or scales suspended from either extremity. As it is of importance that the beam should move easily round its point of support, it rests on polished agate or steel planes, by means of knife-edges of tempered steel, which project transversely from its sides, and serve as the axis of rotation. By this arrangement, the surface of contact is reduced to a mere line, and the friction of the axis of the beam on its support almost entirely obviated. The scales are hung by chains attached to steel hooks, which also rest on knife-edges, but turned upwards instead of downwards, as in the first case. The essential requirements of a B. of this description are: 1st, That the beam shall remain in a horizontal position when no weights are in either scale; and 2d, That the beam shall be a lever of equal arms, or have the distances between the central knife-edge and those at either end exactly the same. To insure the first of these conditions, it is necessary that the centre of gravity of the beam lie vertically below the point of support, when the beam is horizontal. When this is the case, the centre of gravity at which the weight of the beam may be considered to act, oscillates as in a pendulum round the point of support, and always comes to rest right under that point, thus restoring to the beam its horizontal position when it has been tilted out of it. If the centre of gravity were above the point of support, the beam would topple over; and if it coincided with that point, there being no restoring force, the beam would occupy indifferently any position into which it was thrown, the B. in both cases being useless. That a B. possesses the second of the above conditions, is ascertained by putting weights into the scales which keep the beam horizontal, and then transposing them, when, if it still remain so, the lengths of the

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arms are equal. Should the arms be of different lengths, a less weight at the end of the longer arm will balance a larger weight at the end of the shorter arm (see LEVER); but when transposed, the larger weight having the longer arm, and the smaller weight the shorter, the beam can no longer remain horizontal, but will incline towards the larger weight. A balance with unequal arms is called a false B., as distinguished from an equal-armed or just balance. When weighing with a false B., it is usual to weigh a body in both scales, and take the arithmetical mean—that is, half the sum of the apparent weights for the true weight. This is near enough to the truth when the apparent weights differ little from each other; but when it is otherwise, the geometrical mean (q.v.) must be taken, which gives the exact weight in all cases.

Although the preceding conditions are of essential importance, they do not supply all requisites in a good balance. It is necessary, in addition, that the beam should turn visibly from its horizontal position, when there is a slight excess of weight in the one scale as compared with the other. This tendency is termed *sensibility*, and depends upon the weight of the beam, the position of its centre of

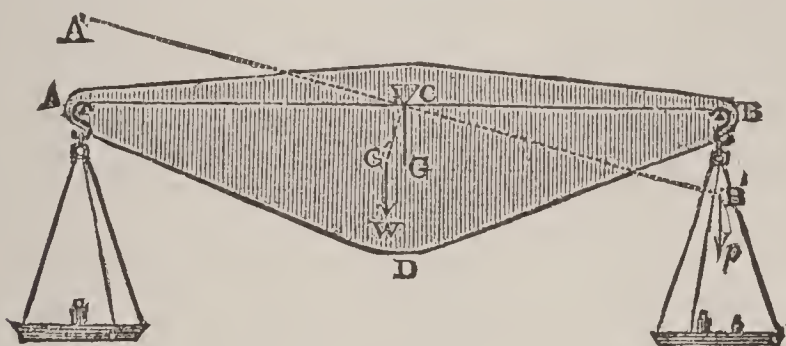


Fig. 1.

gravity, and the length of its arms. Let ABD (Fig. 1) represent the beam of a balance, C the point of suspension, G the centre of gravity, and ACB the straight line joining the knife-edges, which may be taken as the skeleton lever of the balance. The description here given relates to that construction in which the three knife-edges are in a line, because it is the most simple and the most desirable. Without altering the principles of equilibrium, the beam may be considered as reduced to the lever AB, and embody its weight in a heavy point or small ball at the centre of gravity, G, connected with C by the rigid arm CG. The scales (represented small in the fig. for the sake of space), with the equal weights in them being at an equal distance from C, have their centre of gravity in that point; and their combined pressure acting there, is met directly by the supporting plane, so that they have no influence in determining any particular position of the beam. If a small weight, p , therefore, be put into the scale at B, the position of the beam is determined by its rotating tendency (moment) round C, and the counter-rotating tendency of the weight of the beam, W , acting at G. The question of sensibility is thus reduced to the action of the crooked lever GCB,

BALANCE.

with p acting at one end, and W at the other. For the relations of the arms and forces of a crooked lever, see LEVER. It is necessary here only to state, that the moment of the weight acting at the end of a crooked lever, increases with its size, the length of its arm, and the smallness of the angle which that arm makes with the horizontal line passing through the fulcrum. Let us suppose that, under the effect of the opposing moments, the beam, as represented by the line AB , takes up the position marked by the dotted lines. If, now, we were to lengthen CB' , and keep CG' as it is, CG' would rise nearer to the horizontal line, and CB' fall further from it, before equilibrium would be restored; and the inclination of CB' , or the beam to the horizontal line, thus being greater, the sensibility of the balance would be increased. Consequently, *the longer the arms of a B. are, all other things being the same, the greater will be its sensibility.* But the same object would be reached by keeping CB its original length, and shortening CG' , or bringing the centre of gravity of the beam nearer to the point of support. The weight of the balance then having a shorter arm, the point G' , for the same reason as before, would need to rise higher, and B' sink lower, before $A'B'$ would find its position of rest. Here, also, *the nearer the centre of gravity of the beam is to the point of support, the greater will be the sensibility of the balance.* If now, however, we keep the length of the arms CG' , CB' constant, but diminish the weight acting at G' , while p acting at B' remains the same, it is manifest, that to make up the deficiency in the weight W , the two arms will turn to the left, as in the preceding cases, so as to give W a longer, and p a shorter *effective* arm. The smaller, therefore, the weight acting at G , or *the smaller the weight of the beam, the greater will be the sensibility of the balance.*

In the construction of the B., it is important to have the sensibility independent of the amount of weight in the scales, so that, when heavily loaded, a small weight will produce the same inclination as when not loaded at all. This condition is implemented, as we have already shown, when the three knife-edges are kept in the same straight line. If the line joining the two terminal knife-edges lie below the point of suspension, then the centre of gravity of the equal weights corresponding with the middle of that line, will, upon the turning of the beam, be forced from below that point, and will accordingly have a tendency to resume its former position. The equal weights thus counteract to some extent the effect of the additional weight, in causing the beam to incline, and their influence in this way will be all the greater as they themselves increase. When a B. is too heavily loaded for its strength, the three knife-edges, although previously in a line, do not retain that position, for the arms of the beam yielding to the pressure, cause the terminal knife-edges to sink below the one in the middle, and the knife-edges themselves losing their shape under the pressure, the sensibility is considerably diminished.

When a B. is very sensitive, the beam keeps oscillating

BALANCE.

for a considerable time from one side to the other of the position in which it finally settles. Although such an instrument may be useful for physical and chemical experiments, it is not serviceable for the purposes of ordinary life, where minute quantities of the substance to be weighed are of little value, and where time, and consequently rapidity of indication, are important. The sensibility of a B. must, therefore, be adjusted to the purpose for which it is designed; sensitive balances being employed for weighing finer, and less sensitive, or *stable* balances, for weighing coarser materials. The stability, or the tendency of the beam to come quickly to rest, depends on requirements nearly the opposite of those which conduce to sensibility. In the construction treated of above, the stability increases with the moment of the weight of the beam acting at G round C, so that it thus increases with the weight of the

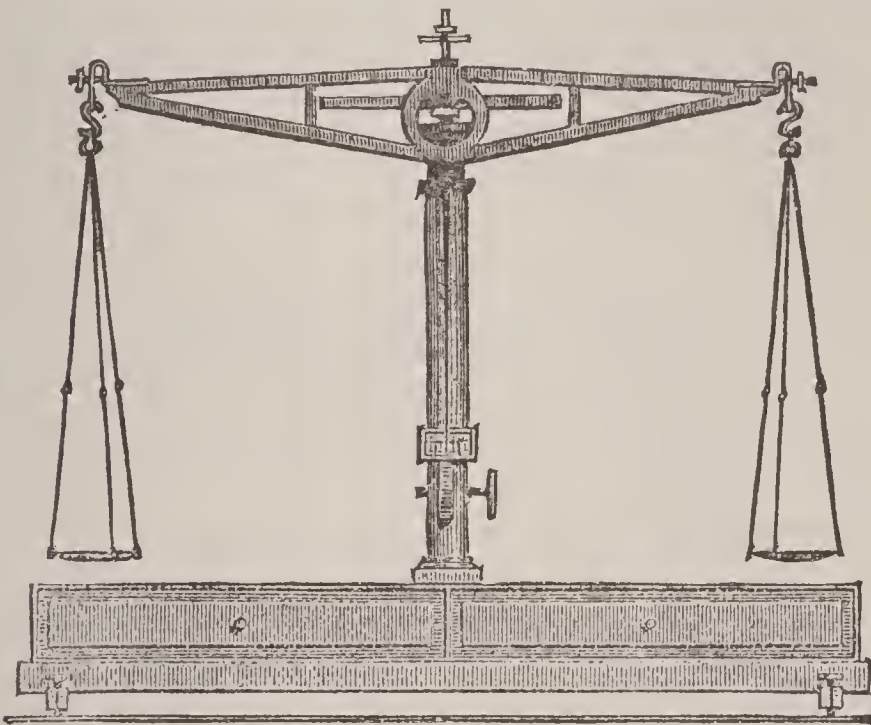


Fig. 2.

beam, and the distance of the centre of gravity from the point of suspension. The stability is also increased, as already shown, by having the line joining the scale knife-edges below the point of support.

Fig. 2 is the representation of a common form of the delicate balances employed in physical and chemical researches. The beam is constructed so as to combine lightness with strength, and rests by a fine knife-edge on an agate plane. It is surmounted by a weight moving on a screw, so that the sensibility may be increased or diminished, according as the weight is raised or depressed. In order that the knife-edge may not become blunted by constant contact with the supporting plane, a cross-bar, with two projecting pins, is made to lift the beam from the plane, and sustain its weight when the balance is not in play. The beam is divided by lines marked upon it into ten equal parts, and a small weight made of fine wire bent

BALANCE.

into the form of a fork, called a rider, is made to slide along to any of the divisions. If the rider be, for instance, $\frac{1}{10}$ of a grain, and if, after the weight of a body is very nearly ascertained, it brings the beam, when placed at the first division next the centre, exactly to its horizontal position, an additional weight of $\frac{1}{100}$ of a grain will be indicated. The use of inconveniently small weights is, by this arrangement, to a large extent obviated. As the beam takes some time before it comes to rest, it would be tedious to wait in each case till it did so, and for this reason a long pointed index is fixed to the beam below the point of suspension, the lower extremity of which moves backwards and forwards on a graduated ivory scale, so that when the index moves to equal distances on either side of the zero point, we are quite certain, without waiting till it finally settles, that the beam will be horizontal. The same is seen in ordinary balances, only the tongue or index is above the beam; and according to its deviation on each side of the fork or cheeks by which the whole is suspended, is the future position of the beam ascertained. The finer balances are never loaded to more than a pound in each scale, and

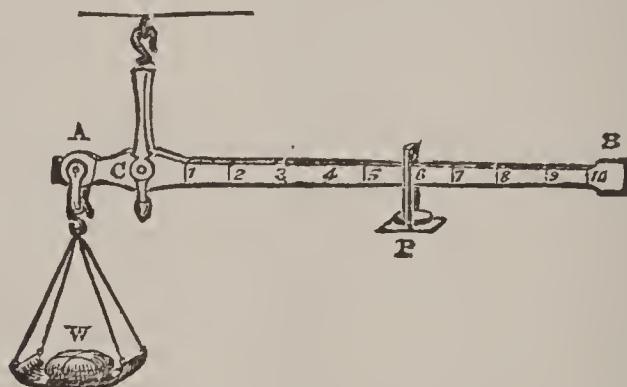


Fig. 3.

when so charged, will deflect with $\frac{1}{100}$ of a grain of additional weight in one of the scales, or will turn, as it is technically called, with $\frac{1}{115200}$ of the load. The finest balances turn with $\frac{1}{1000000}$ of the load, and some have been constructed which turned with much less. Even with the best achievements of mechanical skill, no B. can be made whose arms are absolutely equal; and to remedy this defect, the method of double-weighing is resorted to, when the utmost accuracy is demanded. This consists in placing the body to be weighed into one scale, and sand, or the like, into the other, until exact equilibrium is obtained, then removing the body, and putting weights or another body in its place which exactly counterbalance the sand. Both being thus weighed in precisely similar circumstances, must weigh precisely the same.

The Roman B., or *Steelyard* (Ger. *Schnellwage*), is more portable than the ordinary balance. It consists of a lever (Fig. 3), AB, moving round a knife-edge or point at C. The body to be weighed, W, is put into the scale which hangs from A; and a movable weight, P, is made to slide along the longer arm, until the lever, AB, remains horizontal.

BALANCE—BALANCE-SPRING.

The weight of *W* is then read off from the division at which *P* rests. If the lever lie horizontal when unloaded, then equal weights at equal distances from *C* will balance each other, so that when *W* is balanced by *P* at a distance from *C* equal to *AC*, the two are of equal weight; but if equilibrium take place when *P*, say, is ten times as far from *C* as *A* is, then *W* will be ten times the weight of *P*; and the same holds for any intermediate point at which *P* may stand, *W* weighing as many times *P* as *P*'s arm is a multiple of *W*'s arm. To weigh a body of 10 lbs. by the ordinary *B.*, a counterweight of 10 lbs. is necessary, making a total load of 20 lbs.; but in the case just supposed, 1 lb. balances 10, making a total load of only 11 lbs. The steelyard has, therefore, this advantage over the common *B.*, that the load on the fulcrum, and consequently the friction, is less. On the other hand, however, there is this disadvantage, that the arms of the steelyard bend unequally under the strain of great weights, which in a *B.* with equal arms cannot, to the same extent, take place. As the steelyard is ordinarily made, the longer arm preponderates when the lever is unloaded, so that the graduation of the longer arm begins at a point between *A* and *C*, and not at *C*. The *Danish B.* differs from the ordinary steelyard in having the weight fixed to the extremity of the lever, and the fulcrum movable.

The *Bent Lever B.* (Fr. *peson*, Ger. *Zeigerwage*), shown in Fig 4, is a lever of unequal arms, *A, C, B*, moving round the pivot *C*, having a scale, *Q*, attached to the shorter arm *AC*, and a fixed weight, *W*, to the longer arm *CB*. The longer arm ends in a pointer moving in front of a fixed graduated arc. When a body is put into the scale, the pointer rises from the bottom or zero point of the arc, and rests opposite the mark corresponding to the weight of it.

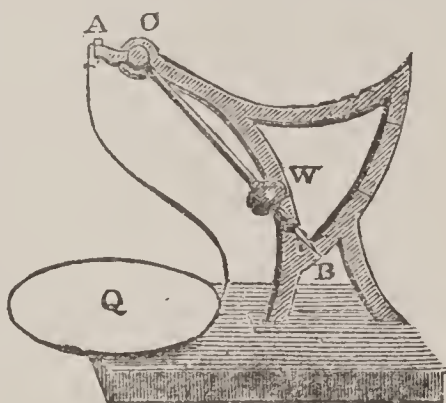


Fig. 4.

The higher the weight *W* rises, the longer becomes its *effective* arm, and the greater must be the weight it balances. The arc is generally graduated experimentally, the geometrical graduation being somewhat complicated.

For other weighing apparatus, see **SPRING-BALANCE: WEIGHING-MACHINES.**

BALANCE-, or **BALANCE-WHEEL**, in Watch-making: a wheel finely poised on its axis; the pivot-holes in which it turns being frequently—in chronometers and clocks, as well as in watches—jewelled, or made of small rubies, diamonds, etc., for the sake of durability. The natural effect of an impulse given to such a wheel would be a complete rotation on its axis. This however, is convertible, by the escapement (q.v.), and by the balance-spring, into a vibratory motion. The balance-spring is held to be a crowning invention in the mechanism of the watch; and the honor of its

BALANCE OF POWER.

suggestion has been claimed for no less than three very eminent men—for Dr. Hooke, an Englishman; for Abbé Hautefeuille, a Frenchman; and for Huygens, the Dutch astronomer. The honor, however, assuredly belongs to Hooke.

The balance-spring consists of a coil of steel wire, so delicately manufactured that 4,000 of them scarcely weigh more than one ounce, though often costing more than \$5,000. In its application to the balance of a watch, one of the extremities (*e*, Fig. 1) of the spring is fastened to a point independent of the balance, while the other is attached near its axis.

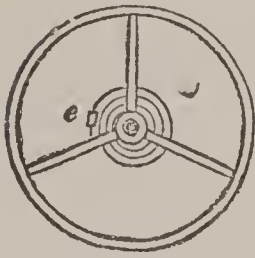


Fig. 1.

When the balance is at rest, the spring is not inclined either way, this position being called the point of rest; but when the impulse is given to the balance by the crown-wheel of the escapement, the balance moves round just so far as the impulse given is able to overcome the elastic resistance of the spring. When that resistance becomes equal to the impulse given, the balance stops for a moment, and then is driven back by the elastic recoil of the spring, and continues thus to vibrate so long as the impulse is repeated or the watch is in motion.

The recoil of the spring is sufficient to drive back the balance to a distance nearly double the length of its first motion; this is, therefore, called the long arc of vibration. But when the motion of the balance is free, with a certain length of spring, the *long* arc of vibration is made in less time than the short one, to which the impulse is given. with a spring of greater length this relation is reversed; whence it was concluded by Le Roy and Berthoud, that equality of time, or *isochronism*, in unequal vibrations, could be more easily obtained by lengthening the spring than by tapering it. In England, where time-keepers have been brought to their greatest perfection, it is considered that isochronism is most easily attainable by using the cylindrical helical spring (*s*, Fig. 2), which is applied to all marine chronometers.

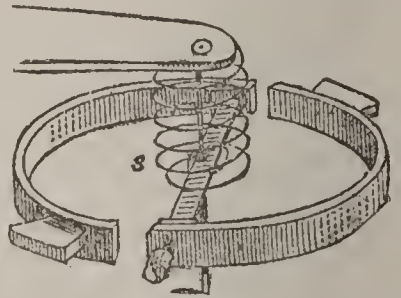


Fig. 2.

An improvement in watches, or rather in chronometers, invented by Mr. Dent of London, consists in coating the balance and balance-spring with gold by the electro-metallurgic process, by which means they are secured from rust.

BALANCE OF POWER, in European Diplomacy: a condition in which no one of the states has such preponderance as to endanger the independence of the others. This idea is not an invention of modern times. The Greek states acted upon it by a kind of instinct of self-preservation, though it was not directly formulated. It has become more distinctly avowed as a motive of political conduct, and more systematically acted upon, since the time of Charles V., whose overgrown power and ambitious designs

BALANCE OF TORSION—BALANCE OF TRADE.

awakened the other European powers to the danger of such overwhelming preponderance in one state. The motive of preserving the balance of power came first distinctly into the foreground in those unions which England, Holland, and Austria, repeatedly formed against the menacing schemes of Louis XIV. for acquiring the dominion of all Europe. It was the same cause that broke up the most dangerous (for Louis) of these coalitions; for in the war of the Spanish succession, when the Hapsburg pretender to the Spanish throne became, by the death of Joseph I., sovereign of Austria and emperor of Germany, and the power which, in the hands of Charles V., had menaced the equilibrium of Europe, was thus likely to be again wielded by one man, England withdrew from the coalition, and thus saved Louis from a decided overthrow. The aggressions of Napoleon called all the powers of Europe to arms against him in the name of the balance of power; and in readjusting the map of Europe, the balance of power was often invoked to cover the jealousy which resisted not a few claims to restitution of territory. For some time, the balance of power in Europe has been embodied as it were, in a pentarchy or permanent congress of the five great powers, England, France, Germany, Austria, Russia, which mutually watch one another's movements. This jealousy among the leading powers on the score of extension of boundaries, is looked to as the great safeguard of the smaller states, preventing their absorption by their powerful neighbors. It was the dread of an adverse coalition that brought the emperor of Russia to agree to the treaty of 1841, and the Crimean war arose out of Russia's renewed attempt to extend her dominion over Turkey. Latterly, the doctrine of non-intervention has to a certain extent gained ground among politicians; and the formation of the kingdom of Italy, the results of the Franco-German war of 1870, 1, and the formation of the German empire, have modified the old ideas, and brought into play new combinations whose results can hardly yet be foreseen.

BALANCE OF TORSION: an instrument invented by Coulomb for comparing the intensities of very small forces. It consists of a metallic wire suspended vertically from a fixed point, to the lower end of which a horizontal needle is attached with a small weight designed to keep the wire stretched. The magnitude of a small force acting on the end of the needle is measured by the amount of 'torsion' or twisting of the wire—the arc which the needle passes over measured from the point of repose.

BALANCE OF TRADE: difference in money value between the exports and imports of a country. In what is sometimes called the 'mercantile system' of political economy, which looks upon the possession of gold as the grand aim, or as at least the chief indication of national financial prosperity, it is naturally a maxim that a nation becomes richer in proportion as the money-value of its exports exceeds that of its imports; the excess, being paid in

BALANCE OF TRADE.

gold, is so much added to the national wealth. On this theory, the balance of trade was said to be 'in favor' of the country or 'against' it, according as the exports or the imports showed the excess.

Another school of financial theorists asserts that this view rests on a twofold error; since, in the first place, the increase of national wealth is not identical with the immediate influx of hard cash; nor is gold the highest expression of national wealth, but only a means of turning real wealth and the faculty of labor to account. Further, it is asserted that the assumption that excess of exports represents excess of income, is completely false—taking exports for income (because payment is received for them), imports for expenditure (because they must be paid for); while it would be more consistent with the truth to say that exports are identical with expenditure, and imports with income; so that wealth increases in proportion as the value of the imports (what is received) exceeds that of the exports (what is given away); and it is claimed that this is the case whether these exports and imports consist solely of goods or partly of money. It may sometimes be desirable to get payment of exports in gold—that is, to import bullion. But the case in which this will be beneficial to the merchant seeking his own profit in the transaction, will be that in which it will be beneficial to the community. In the majority of cases, however, the individual merchant finds it his best policy to lay out the money due to him in a foreign country in purchasing the wares of that country as return-value. The far-sighted Venetians early recognized the truth of the principle in a national point of view; for, by a law of 1272, they laid a tax of one-fourth the value on the importation of all coined gold and silver. The 'mercantile system' of political economy, on the contrary, consistently following up the notion of the balance of trade, it is said, favors laws prohibiting importation of foreign manufactures, or imposing high duties upon them, and giving premiums and other protective encouragements for exportation; as if it were possible to go on exchanging always for gold only—ever exporting goods and goods alone, and never importing any. If this could be, and if it were true that a nation with the balance of trade constantly in its favor must become richer, while, with that balance against it, it must become poorer, England, whose official returns have for many years exhibited a large excess of exports over imports, must have had at this time about 500 million pounds in precious metals, while in reality the amount does not exceed perhaps 60 millions.

The truth is, that no safe conclusion can be drawn from the balance of trade exhibited in official statements; since from the way in which they are arrived at, a great part of the facts of the cases are necessarily left out, while an entire range of important facts are not capable of expression in statistics. Almost all nations exhibit favorable balances, and how could that be possible, if the whole presentation were not defective? In the regular legitimate commerce between two nations, both actually gain, though the gain may not

BALANDRA—BALANUS.

be exhibitable in the form of a money-balance. If the gains of nations from commerce consisted of differences between the amount of exports and of imports to be compensated by balances in money, nearly all nations would be yearly receiving accessions of gold and silver, the united amount of which would exceed, by more than ten times, the produce of all the mines in the world.

BALANDRA, n. *ba-lānd'ra* [Sp. and Port. *balandra*]: a kind of vessel with one mast, used in South America and elsewhere.

BALANIDÆ, n. plu. *bāl-ān'ī-dē* [L. *bālānus*; Gr. *bal-ānōs*, an acorn: Gr. *eidos*]: the family of Crustaceans, commonly known as acorn-shells: see **BALANUS**.

BALANINUS, n. *bāl a nī'nūs* [L. *balaninus*—from Gr. *balaninos*, made from the *balanos*]: genus of beetles belonging to family *Curculionidæ*. They have a long, slender rostrum, furnished at the tip with a minute pair of sharp horizontal jaws, which they use in depositing their eggs in nuts; e.g., *B. caryæ*, in hickory nuts; *uniformis* and *quercus* in acorns; *Sayi* in chestnuts.

BALANITE, n. *bāl'an-īt* [Gr. *balanites*, as a., acorn shaped; as n., a precious stone]: a fossil Cirripede of the genus *Balanus*, or closely allied to it.

BALANOPHORACEÆ, n. plu. *bāl-ān-ō-fōr-ā'sē-ē*, or **BALANOPHOR'ÆÆ**, *-ē-ē*: an order of plants placed by Lindley under the class *Rhizanthæ* or *Rhizogens*, but believed by Dr. Hooker to have an affinity to the exogenous order *Haloragææ* or Hippurids. They are succulent, fungus-like, leafless plants, usually yellow or red, parasitical upon roots. The flowers are mostly unisexual; they are crowded together in heads or cones. The perianth in the males is generally three or six cleft; the ovary has one or two styles, but only one cell and one pendulous ovule. They occur in America, Africa, and Asia; one species occurs in Malta. They seem to have styptic properties.

BALANUS, *bāl'a-nūs*: genus of *Cirripedia* (q.v.); the type of a family, including all cirrhopods destitute of a flexible stalk, and of which the shell is symmetrical. These characters at once distinguish them from Barnacles (q.v.). In the genus *B.*, the base is formed usually of a thin calcareous plate, the sides of six valves; and four small valves form the operculum, exactly closing the aperture at the top. The name (signifying an acorn) was originally given by the ancient Greeks, from a supposed resemblance of some of the kinds to acorns; and acorn-shell has sometimes been adopted as an English name. There are many species, and they are found in almost all seas, attached to stones, timber, shells, crustaceans, etc. They cover the rocks between high and low water-mark on many parts of the coast as with a white calcareous incrustation, so that arithmetic fails in computing, and imagination in conceiving their multitudes. They may, however, be readily passed over as individually objects of little interest when they are seen after the tide has left them, for then their valves are closed, and they ex-

BALAS—BALASINORE.

hibit no sign of life; but if observed in a pool of the rocks, or anywhere under water, they present a very different and extremely pleasing spectacle, the opercular valves continually opening and shutting with a quick but nearly regular motion, while an exquisitely delicate apparatus of feathery arms or cirrhi (see CIRRHOPODA) is as frequently thrown out and retracted like a hand or a little net, to seize and carry in to the mouth the minute nutritious particles or very small animals upon which the creature feeds. Thus, the little balani, immovably fixed to the rock, or carried about at the pleasure of mollusks or crustaceans to which they adhere, obtain their food from the waters around them.

A remarkable fact in the natural history of these creatures has recently been discovered by Mr. Thompson of Cork, that in the earlier stages of their existence they are not fixed as in their adult state, but move about very actively in a succession of bounds, by means of swimming-feet like those of the *Cyclops* (q.v.); having, however, a shell, apparently of two valves, resembling a very minute muscle. Still more remarkable is the discovery made with this, that in their early locomotive state they possess large stalked eyes, which disappear with the organs of locomotion when they attach themselves—probably by the guidance of some peculiar instinct—to their final place of repose, undergoing a transformation into perfect cirrhopods, and acquiring as a covering their many-valved shell.

Some of the larger species of *B.* were esteemed a delicate food by the ancient Romans. The Chinese similarly esteem *B. tintinnabulum*, said to resemble lobster in taste; and *B. psittacus*, a South American species, in like manner compared to crab, is exported in large quantities from Concepcion de Chili to Valparaiso and Santiago. This species is sometimes almost four inches in diameter, the height considerably more. It is chopped off the rocks with a hatchet. The two posterior opercular valves are beaked, from which it receives the name of *Pico*, and its scientific trivial name, *psittacus* (a parrot).

BALAS, or BALASS, n. *bāl'ās*, or BALAY, or BALAIS, *bāl'ā* [Sp. *balax*: F. *balais*]: lapidary's term for the varieties of the spinel ruby of a bright rose-red color inclining to orange, as distinguished from the ruby proper, which is of a bright red or cochineal color, and from the spinel ruby, which is of a red hue approaching to rose-color. This last (the spinel ruby) has been recognized only in modern times. In the middle ages, only the *B.* ruby and the ruby proper, or *le beau rubis*, as it was often called, seem to have been known. M. de Laborde thinks that the term *B.* was employed anciently as a name for all sorts of rubies.

BALASINORE, *bāl-a-sī-nōr'*, or BALASINESHWAR: petty native state, or *jaghire*, of India, province of Guzerat; protected by the British govt., and politically connected with the presidency of Bombay: from n. lat. 22° 53' to 23° 17'; from e. long. 73° 17' to 73° 40'; about 80 sq. m. The river Mahi flows through the *jaghire*. The native ruler is styled Nawab of Balasinore. He has a revenue of 41,548 rupees,

BALASORE—BALBI.

of which he pays 10,000 rupees tribute to the British govt. The Nawab maintains a force of only 8 horsemen and 50 foot-soldiers, employed in revenue, police, and other services. Pop. est. 42,000.—The cap. of the jaghire, 51 m. n. from Baroda, also bears the name Balasinore. It is rather a thriving town, and is surrounded by a wall.

BALASORE, *bāl-a-sōr'*: seaport in the dist. of Cuttack and presidency of Bengal, near the Boorabullung, which enters the sea to the w. of the Hoogly or Calcutta river: lat $21^{\circ} 30' \text{ n.}$, long. 87° e. , and has dry-docks and a coasting-trade; but it is entitled to notice chiefly in connection with the past, as the seat, successively, of Portuguese, Dutch, and Danish factories. It was only in 1846 that the Danes sold their interest in the place to the English.

BALATON, *bā'la-ton*, LAKE OF (Platten-See): a lake, the largest in Hungary; about 55 m. s.w. of Pesth. Its extreme length is 48 m., breadth from 3 to 10 m., estimated area, including its frequently submerged marshes, 420 sq. m. Its greatest depth is 39 ft. It is supplied by upwards of thirty streams—the chief of which is the Szala—as well as by numerous springs on its margin. Its outlet is by the Sio, which discharges into the Sarvitz, a feeder of the Danube. The waters of B. are clear and transparent, except when they are agitated by a storm, when they assume a bluish color. They have a slightly brackish taste. Fish of various kinds are abundant, and sand impregnated with iron, interspersed with which are small garnets, rubies, and other precious stones, is taken from it. Woods and vineyards cover the hills which encircle its n. sides, and on its banks near the town of Fűred there is a spring of acidulous water. The surrounding country is rich in rare plants and mineral treasures, and was the scene of several bloody conflicts during the Hungarian war (1848,9). The lake figures prominently in the old romantic ballads of the Magyars.

BALAUŠ'TA: see BERRY.

BALAUŠ'TINE, n. *bāl-laws'tīn* [Gr. *balaus'tiōn*, a pomegranate flower]: the wild pomegranate tree. BALAUŠ'TA, n. *bāl-laws'tā*, fruit formed like the pomegranate; an indehiscent fruit, with many cells and seeds, the seeds being coated with pulp.

BALAY, or BALAIS: see BALAS.

BALBI, *bāl'bē*, ADRIANO: 1782, Apr. 25—1848, Mar. 14, b. Venice: geographical and statistical writer. In 1808, he gained so much credit in Italy by his first geographical work, that he was appointed prof. of geography in the coll. of San Michele at Murano, and in 1811, prof. of physics in the Lyceum at Fermo. Subsequently he resided in Portugal, then went to Paris, to superintend the publication of his *Essai Statistique sur le Royaume de Portugal et d'Algarve* (2 vols., Par. 1822); soon followed by the *Variétés Politiques et Statistiques de la Monarchie Portugaise* (Par. 1822). He was the intimate friend of Malte Brun, from whose papers he, jointly with Larenaudière and Huot, published the *Traité Élémentaire de Géographie* (2 vols., Par. 1830–34).

BALBI—BALBO.

He published several works of comparative national statistics. His *Atlas Ethnographique du Globe* (Par. 1826) is distinguished by its extensive accumulation of facts and views, giving an account of German researches on the subject, and entering into questions of comparative philology. B.'s best known work is, however, the *Abrégé de Géographie* (3d ed., Par. 1838), which has been translated into several languages. In 1832 he returned to Italy, and settled at Padua, where he died. A collection of his *Scritti Geografici* was made by Eugenio Balbi (5 vols., Turin, 1841, 2).

BALBI, GASPARO: Venetian merchant of the 16th c., worthy of mention as the first traveller who has left an account of India beyond the Ganges. In his business B. was often led to Aleppo, and thence, on one occasion, he went to India, remained several years, and returning to Venice, published, 1590, a vol. entitled *Viaggio all' Indie Orientali*. A Latin translation was printed in De Bry's *Collection of Voyages and Travels to the East Indies*, Frankfort, 1590–94. B. appears to have set down, without exaggeration, all that he himself saw, and is particularly minute and exact concerning commercial matters; but there is scarcely any limit to his credulity with regard to what he heard from others about the country. From Aleppo, his journey was down the Euphrates until opposite Bagdad; thence down the Tigris to Bassorah, where he embarked for the Malabar coast. Having visited Goa and Cochin, and other Portuguese settlements, he sailed for Pegu, then an independent empire, where he remained two years, returning by the same route. The most interesting part of his narrative is that relating to Pegu.

BALBINUS, *bāl-bī'nūs*, DECIMUS CÆLIUS, Emperor of Rome; d. 242: one of two emperors whom the senate elected (on hearing of the death of the elder Gordianus, and his son, in Africa), in opposition to Maximinus, who had the support of the legions in Germany. He was celebrated as orator and poet, and was a man of mild disposition. His coadjutor, Marcus Clodius Pupienus Maximus, was a bold and resolute soldier who had risen from the people. They had only reigned a few months—during which time Maximinus had been killed by his own soldiers, who afterwards submitted to Maximus—when they were both killed by the prætorians, who at that time were animated by bitter hostility to the civilians, and extended it to the rulers who had been elected by them.

BALBO, *bāl'bo*, CESARE: 1789, Nov. 21—1853, June 3; b. Turin: Italian statesman and author. When 18 years old, B., whose father had Napoleon's patronage, was appointed auditor of the council of state in Paris, and 1812 he was made commissioner for the Illyrian provinces, ceded to France by the peace of Vienna. After the fall of Napoleon, B. went to London as sec. of the Sardinian embassy. Turning to historical studies, he produced (1821–43) *History of Italy* (only to the reign of Charlemagne); and a translation with commentary of Leo's *Development of the Constitution of the Lombardic Towns*; also *Speranze*

BALBOA—BALBRIGGAN.

d'Italia ('Hopes of Italy'), pub. 1843, which extended his literary reputation to foreign countries. One of its main objects was to prove that national independence must precede the enjoyment of constitutional liberty; and that to strive after the latter, however good in itself, while the former had not been secured, was foolish and reprehensible. It gave a vivid and intelligent picture of the political condition of Italy, its aims and prospects. His compendium of Italian history (*Della Storia d'Italia*, etc.) also was successful. B. was prominent as a moderate liberal in the political movements of 1847,8, and subsequently supported the ministry of Azeglio. He was a man of unspotted character. In all his writings B. adhered strongly to the Rom. Cath. Church, whose truth he conceived to be the healing of nations and the only source of true culture.

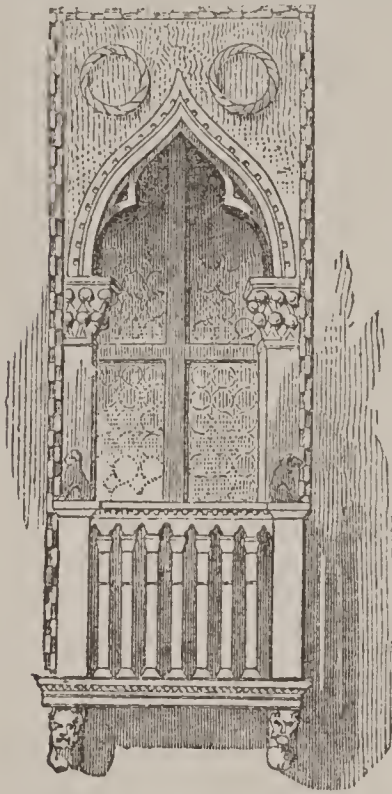
BALBOA, *bál-bō'á*, VASCO NUÑEZ DE: Spanish conqueror: 1475-1517; b. of a noble but reduced family at Xeres-de-Caballeros. After a dissolute youth, he gladly took part in the great mercantile expedition of Rodrigo de Bastidas to the new world. He established himself in St. Domingo, and began to cultivate the soil; but coming into financial straits, he escaped from his creditors, embarking secretly on a ship, and joined the expedition to Darien, 1510, commanded by Francisco de Enciso. Destined to discover the eastern shores of the largest ocean on the globe, he was yet compelled to secrete himself in a cask before he could share in the new enterprise. An insurrection obtained for B. the supreme command in the new colony. Confused accounts which reached him of a great western ocean, impelled him, 1513, to set out in quest of it, and, Sep. 25, he obtained the first sight of the Pacific Ocean from a mountain-top in the Isthmus of Panama. His natural enthusiasm at this great discovery was shared by all the educated men of his time, and the descriptions of it by contemporary authors may still be read with much interest. The governorship of the territories conquered by B. was obtained 1514 by Pedrarias Davila, by intrigues at the Spanish court. B. resigned the command into the hands of the new governor, a narrow-minded and cruel man, and, in a subordinate situation, undertook many successful expeditions; but these, and all his other merits, only served to increase the hatred of Pedrarias Davila towards him. The government of the mother-country sought in vain to mediate between them, and B. even married the daughter of Pedrarias. But on the first occasion of dispute which arose, B., having been induced by Pedrarias to deliver himself up, was accused of a design to rebel, and in violation of all forms of justice was beheaded at Santa Maria.

BALBRIGGAN, *bal-brig'gan*: small maritime town in Dublin county, 22 m. n. of Dublin; a seat of cotton, calico, and stocking manufactures. The cotton stockings made here are remarkable for fineness of texture and beauty of open work. Many women are employed in embroidering muslins. B. is a favorite watering-place. After the battle of the Boyne, William encamped here. Pop. (1891) 2,273

BALBUTIES—BALDACHIN.

BALBUTIES, n. *băl-bū'tī-ēz* [Fr. *balbutie*, inarticulateness bad pronunciation—from *balbus*, stammering]: in *med.*, stammering.

BALCONY, n. *băl'kō-nī* [F. *balcon*, a balcony—from It. *balcone*; Pers. *bala khaneh*, an upper chamber]: a projecting gallery in front of windows, or elsewhere on a house-wall, with a balustrade or parapet before it, and supported by consoles, or brackets fixed in the wall, or by pillars from below. The B. was unknown in Greek and Roman architecture, the earliest examples occurring in Italy. Balconies constructed of wood are very frequent in the cottage architecture of Switzerland, to which they add picturesqueness. **BALCONIED**, a. *băl kō-nīd*, having balconies.



Balcony.

BALCONY, in naval construction: the gallery or stern-walk outside the stern of a large ship. Three-deckers have two such balconies, and two-deckers one. Where there are two, the lower is connected with the admiral's state-cabin, and the upper with the captain's cabin.

BALD, a. *barld* [Gael. *bal* or *ball*, a spot; W. *balli*, whiteness; Fin. *paljas*, naked, bare; Dan. *baldet*, unfledged; Gr. *balios*, speckled with white hair; Sp. *pelado*, hairless]: wanting hair; destitute of natural covering; naked; inelegant; mean; in *bot.*, without beard or awn; having a white mark on the face. **BALD'LY**, ad. *-lī*. **BALD'NESS**, n. state of being bald; the want of natural covering, as the head without hair on its crown, or the top of a hill when bare of trees. **BALD FACED** [F. *bellesface*]: having a white mark on the face, as a stag. **BALD-COOT**, a black aquatic bird with a conspicuous excrescence of white skin above its beak. **BALD-PATE**, a. or n. *pāt*, or **BALD-PATED**, a. *-pāt'ēd*, destitute of hair on the head; shorn of natural covering.

BALDACHIN, n. *băl'dă-kīn* [It. *baldacchino*; Sp. *baldaquino*, a canopy (see **BAUDEKYN**)]: in *arch.*, structure within a building in the form of a canopy or tent, usually of costly materials, supported by columns, or fastened to the wall, placed over portals, thrones, altars, pulpits, couches, etc. One of the most celebrated is the B. in the church of St. Peter's, Rome, cast in bronze by Bernini, supported on four large twisted columns. B. was the name also formerly given to a kind of umbrella of a square form, made of silk brocade or other rich material, and supported on four poles, which was wont to be carried in the middle ages at solemn processions coronations, marriages, etc., over the heads of royal personages or high dignitaries

BALD EAGLE—BALDER.

as a symbol of their rank. In Europe, the portable B. is now used chiefly in the processions of the Rom. Cath. Church. It is generally borne over the priest who carries the Host. The word B., as well as the thing itself, comes from the east, where, partly as a protection from the burning rays of the sun, partly as a symbol of their power and dignity, the rulers and great personages seldom appeared in public, whether on foot or on horseback, in a litter or on an elephant, without a splendid canopy, often borne by the great men or chief officers of their kingdom. These canopies, generally made in the form of a tent or umbrella, were often sent, in the early part of the middle ages, as presents from eastern princes to those in the west; as, for example, from the Caliph Harun-al-Raschid to Charlemagne. During the Crusades, and the consequent trade with the east, they became well known to the Italians. Such canopies, as well as the rich stuffs of which they were made, were called, from the land whence they came, *Babylonica*; and also *Baldachins*, from *Baldach*, the eastern name of the city of Bagdad.

BALD EAGLE, or WHITE-HEADED EAGLE: see EAGLE: ERNE

BALDER, or BALDUR, *bál'dér*: a divinity worshipped by the ancient Scandinavians, and probably also by the other Germanic nations; the hero of one of the most beautiful and interesting of the myths of the Edda. B., who, according to old northern mythology, was the second son of Odin and Frigga, and the husband of Nanna (maiden), dreamed evil dreams which threatened his life. When he related them to the gods, they held a council, and endeavored to secure his safety. Frigga took an oath from fire and water, from iron and all metals, from stones, earth, and plants, beasts and birds, the serpent, poison, and all diseases, that they would not harm Balder. After this, the gods in their mirth sported with B., wrestled with him, and cast darts at him, but nothing could injure him. While the gods rejoiced at this, the thing displeased Loki (mischievous cunning or destructive fire). He changed himself into the form of an old woman, and inquiring the cause of the invulnerability of B., was told by Frigga that all things, animate and inanimate, had sworn not to harm him, with the exception of one little shrub, the mistletoe. Loki went in haste to fetch this shrub, and taking it to the assembly of the gods, placed it in the hands of the blind Höder, the god of war, directed his aim, and B. fell pierced to the heart. The sorrow of the gods was unutterable. Frigga asked who, to win her favor, would journey to Hel—the goddess of Hades or the grave—to release Balder. Hermoder or Helmod (the heroic), the son of Odin, readily offered his services, and Hel consented to grant his request on condition that all things should weep for Balder. All men, all living beings, and all things wept, save the witch or giantess Thöck (stepdaughter of Loki), who refused to sympathize in the general mourning. B. was therefore obliged to remain in the kingdom of Hel until the end of the world.

The myths of B. have been very differently interpreted.

BALDERDASH—BALDNESS.

According to some writers, B., as the originator of all that is beneficent and good—for B. and the other *sons* of Odin (see SCANDINAVIAN MYTHOLOGY) are only personified aspects or functions of the dimly-conceived one unseen Power that moves all nature—is represented as a hero of so lovely and graceful a manly beauty, that a brilliant light streams from his person; the whitest of the northern flowers is named *Balders-brow*. As the god of peace of the Germanic nations, who conducts to peace through battle and victory, he is a purely ethical conception, a mythical personification of the peace obtainable through conflict, and agreed to by compact among the gods. The gods, foreseeing doubtless that peace cannot long endure, seek in every possible way to secure the precious life of B., as even the weakest and most insignificant have it in their power to destroy peace. Loki, in his symbolical character as the god of retributive justice, stirs up Höder, or War, through whom the god of peace falls. Höder, indeed, is also slain by Wali, or Val-fader, the battle-god, and the war is ended by a bloody overthrow; but once violated and broken, peace is irrevocably lost together with Balder. Hermoder or Helmod labors in vain to restore it, for the giantess Thöck (retaliation, revenge) prevents it. Holy and true peace can revive only in a new world, when the old sinful world and the old guilt-stained gods now ruling it shall have been destroyed.—Others (among them Max Müller) see in the myth of B. only a representation of the contest between Winter and Summer. The tale of B. has been repeatedly treated by English poets, as by Dobell. See the works of Petersen, Wagner, Bügge.

BALDERDASH, n. *bawld'ër-däsh* [W. *baldorddi*, to babble or prate: Dut. *balderen*, to bawl: Icel. *baldrast*, to make a clatter: Dan. *buldre*, to make a loud noise]. words jumbled together without sense, taste, or judgment; jargon.

BALD-LOCUST, n. [Heb. *salgham*, *saleam*, or *salam*—from E. Aram. *salgham*, *saleam*, or *salam*, consumed]: a winged and eatable species of locust, not yet properly identified.

BALD-MONEY, n. *bawld'mün-i*, or **BAWD'MONEY** [a corruption of L. *valde bona*, exceedingly good]: Eng. name of the *Meum*, a genus of umbelliferous plants. One species, *M. athamanticum*, has a fusiform root, eaten by the Scottish Highlanders as an aromatic and carminative. The whole plant has a strong smell.

BALDNESS (*alopecia*): absence of hair on the head, or on parts of it. See **HAIR**. There are some rare cases on record in which the hair has never been developed. This is termed *congenital baldness*.

Accidental baldness may involve the whole scalp, or may be only in patches; these patches may run into each other; hence some consider this condition a species of ringworm. It is caused, says Sir Erasmus Wilson, by an atrophy of the hair-follicles (q v.). B. in the comparatively young and middle-aged may occur from wearing waterproof caps, which, by preventing evaporation from the head, occasion

BALDO—BALDRICK.

an unhealthy state of skin. Naval and military officers are liable to B. arising from this cause.

Senile baldness (calvities) is not necessarily the consequence of age—it may arise, like the preceding variety, from an atrophy of those parts on which the hairs depend for nutrition. It begins usually on the crown of the head, where the supply of blood is naturally less abundant. Women have more of soft tissue under the skin, therefore the vessels are less likely to be interfered with; hence they are not so frequently bald as men.

The causes of B. are the defective supply of nutrition just mentioned, a family tendency, late hours, dissipation, but especially old age. The hair falls off after severe illnesses, or after other causes of general debility. During pregnancy the hair falls out; and the long hair of young women, victims to consumption, is sometimes almost completely shed.

Treatment of baldness consists in attention to cleanliness, and in exciting the languid circulation of the scalp to greater activity, by using a hard hair brush, and the application of stimulants, as the Spanish-fly ointment in the proportion of two drachms to an ounce of lard mixed with about the same quantity of pomatum. Or the stimulants may be applied in the form of lotions. But at the same time constitutional debility should be remedied by attention to the various functions of the body; tonics should be administered; and, if possible, causes of anxiety or night-watching should be avoided. Shaving the whole head is sometimes resorted to. If these remedies are successful, downy white hair, like that of an infant, begins to grow, which may or may not acquire the color and vigorous appearance of the former growth.

BALDO, *bál'dō*, MON'TÉ: mountain of Lombardy, on the e. of Lake Garda; elevation 7,100 ft. It contains interesting petrifications, and the fine green sand known as the sand of Verona.

BALDRICK, n. *bawl'drĭk*, or BAUDRICK, *baw'drĭk* [mid. L. *baldrei'us*; F. *baudrier*, a baldrick: Icel. *belti*; L. *balteŭs*, a belt]; a band or sash worn partly as a military and partly as a heraldic symbol. It passes round the waist as a girdle, or passes over the left shoulder, and is brought down obliquely under the right arm, or is suspended from the right shoulder in such a way as to sustain a sword. Many of the effigies of knights contain representations of the B., more frequently as a belt than a shoulder-sash. Old French forms of the word found are *baldret*, *baldrei*, from the Old High German *balderich*, a girdle, an extension of *balz*, a belt.



Baldrick.

BALD-TYRANTS—BALDWIN II.

BALD-TYRANTS, n. pl.: Eng. name of genus of birds, *Gymnocephalus*, belonging to family *Ampelidæ*. Its habitat is S. America. Its name is derived from the absence of feathers on a considerable portion of its face.

BALDUNG, *bál'dúng*, HANS, called also Hans Grün: abt. 1470–1552; b. Gmünd, Swabia; d. Strasburg: German painter and wood-engraver, contemporary of Albert Dürer, to whom, in expression, coloring, and finish, he was little inferior as a painter. His master-piece, a painting of the Crucifixion, is in the cathedral of Freiburg; his wood-engravings are numerous.

BALDWIN I., *bawld'wín*, first Latin Emperor of Constantinople: 1171–1206; b. Valenciennes; son of Baldwin, Count of Hainault, and Margaret, Countess of Flanders. In 1193, he succeeded to his mother's possessions, and 1194 to the title and county of his father. In 1200, he appointed his brother Philip, with other persons, to the regency of Hainault and Flanders, and joined the fourth Crusade. Part of the Crusaders—B. among others—were induced to assist the Venetians in reconquering Zara, in Dalmatia, from the king of Hungary. While at Zara, the young Alexis, son of Isaac II., Emperor of Constantinople, craved the assistance of the Crusaders against his uncle Alexis Angelus, who, having deposed and blinded Isaac II., had usurped the throne. In return for their aid, he promised them a liberal sum of money, and also to help them to recover Palestine. The Crusaders agreed, and soon defeated the usurper's forces, and restored the rightful emperor; but Alexis having some difficulty in carrying out his promises, they turned their arms against him. A revolution broke out in the city at the same time, Alexis the younger was murdered, and his father is said to have died of grief. Alexis Ducas Murzuphlus then usurped the throne, but was defeated by the Crusaders, and the city was sacked—the Crusaders and Venetians sharing the booty. B. was chosen emperor, and crowned 1204, May 9; but he received only about a fourth part of the empire—Constantinople and Thrace—the Venetians obtaining the greater share of the provinces. A part also fell to the French adventurers who accompanied the expedition, and several provinces remained in the hands of Greek princes. The abilities of B.—and they appear to have been superior—were not adequate to so anomalous a position. The Greeks were discontented; and, backed by Calo-Joannes, King of Bulgaria—while B.'s brother, with the flower of his troops, was away on an expedition in Asia—they rose and massacred the Latins scattered through the towns of Thrace, and made themselves masters of Adrianople. B. laid siege to the town with the forces at his disposal; but was defeated and taken prisoner by the Bulgarian king, and died in captivity about a year afterwards. He was succeeded by his brother Henry.

BALDWIN II., Emperor of Constantinople: b. 1217; son of Peter de Courtenay and Yolanda, Countess of Flanders, sister of Baldwin I. Being but 11 years old

BALDWIN I.—BALDWIN III.

when, by the death of his brother Robert, he succeeded to the throne, he was placed under the guardianship of John of Brienne, titular king of Jerusalem, who died about 1237. B. then assumed the rod of empire, but he had neither the means nor the ability to hold it against his powerful Greek and Bulgarian opponents. Two begging-visits to Western Europe, in one of which he left his son Philip in pledge at Venice for a debt, and disposed of several most holy relics for money, did not procure sufficient forces to resist his foes; and, 1261, July 15, his capital was taken at night by one of the generals of Michael Palæologus, ruler of Nicæa, and B. fled to Italy. With him terminated the Latin Empire in the East, after it had lasted 57 years. His descendants for more than a century retained the title of emperor.

BALDWIN I., King of Jerusalem: 1058–1118 (reigned 1100–18); youngest bro. of Godfrey de Bouillon (q.v.), Duke of Lower Lorraine or Brabant. He was in the first Crusade: but having quarrelled with Tancred, he retired to Edessa, at the request of the Christian inhabitants of the place, and was soon elected Count of Edessa. After the death of his brother Godfrey, 1100, he became Protector of the Holy Sepulchre, and Baron of Jerusalem, and immediately assumed the regal title, which his brother had refused. He conquered Cæsarea, Ashdod, and Tripolis, and with the assistance of a Genoese fleet, he became master also of Acre, and subsequently of Sidon, but failed to reduce Ascalon. Unlike his brother, who was a disinterested enthusiast, B. was worldly and ambitious.

BALDWIN II. (Baldwin du Bourg), King of Jerusalem: succeeded his cousin Baldwin I., who had made him Count of Edessa when he ascended the throne of Jerusalem; reigned 1118–31. During his reign Tyre was taken, 1124, with the assistance of a Venetian fleet; and the order of the Templars was instituted. Having been taken prisoner by the Turks, B. endured a captivity of six months. He died 1131, Aug. 21, leaving four daughters. Shortly before his death he resigned the crown in favor of his son-in-law, Foulques of Anjou, who reigned till 1134.

BALDWIN III., King of Jerusalem: 1129–62 (reigned 1143–62); son and successor of Foulques of Anjou. He was a model of knighthood, which, during the period of the first Crusades, was a personification of Honor, Justice, Devotion, and Love. Edessa was lost to the Christians during his reign. In 1152, he fought victoriously at Jerusalem against Nouredin, the sultan of Aleppo. In 1157, after he had defeated the same prince at Jacob's Ford, on the Jourdan, he again humbled him severely near Putaha. After this, he ruled in peace, and endeavored to improve both the external and internal defenses of his kingdom. The authority and influence of B. were so great, that even Saracens followed under him the banner of the Cross. By his marriage with Theodora, the daughter of the Greek Emperor Manuel, he gained a faithful ally in that prince. He died, of poison, at Tripolis, Syria, 1162, Feb. 10. With

BALDWIN.

his death the Christian power in the East began to decline. He was succeeded in the government by his brother Amalric or Amaury, who d. 1173.—Amalric was succeeded by his son, BALDWIN IV., surnamed the Leper (reigned till 1183).—BALDWIN V., son of Sybilla, sister of Baldwin IV., was called to the throne, a child, five years of age: d. 1187, a year before Jerusalem was retaken by Saladin.

BALDWIN, ABRAHAM: statesman: 1754–1807. He studied at Yale, graduating 1772, and after acting as a tutor four years, was a chaplain in the revolutionary army until 1784, when he settled in Savannah, Ga., and was sent to the legislature. He was a member of the continental congress, of the constitutional convention of 1787, of the U. S. house of representatives 1789–99, and of the U. S. senate 1799–1807. It is said of him that the latter body owed to him its existence through his course in the constitutional convention. B. founded the Univ. of Ga., and Baldwin co., Ga., was so named in commemoration of his services.

BALDWIN, CHARLES H.: naval officer: 1822, Dec. 23—1888, Nov. 17; b. New York. He was entered as midshipman in the U. S. navy 1839, Apr. 24; became passed midshipman 1845, July 2, and lieut. 1853, Nov. He served on the Pacific coast during the Mexican war, and resigned 1854, Feb. 28. In 1861 he re-entered the service as acting lieut., and commanded the steamer *Clifton* during Farragut's passage of the forts below New Orleans and at the siege of Vicksburg. He was promoted commander 1862, Nov. 18; capt. 1869, June 12; commodore 1876, Aug. 8; rear-admiral 1883, Jan. 31; and retired 1884, Sep. 3. He d. 1888, Nov. 17.

BALDWIN, HENRY PORTER: statesman: b. in R. I., 1814. He removed to Mich. 1838 and settled in Detroit, where he established a successful banking business. He became prominent in political life, was for two years a member of the state senate, and 1869 was elected gov. of the state, and held that office until 1873. While gov. he procured the erection of the state capitol at Lansing. B. was appointed U. S. senator from Mich. 1879–81, filling an unexpired term. He d. 1892, Dec. 31.

BALDWIN, JEDUTHAN: soldier: 1732, Jan. 13–1788, June 4; b. Woburn, Mass. During the old French and Indian war, 1755, he was in command of a company. In 1774–5 he was a member of the Mass. provincial congress, and was one of those who earliest responded to the call of the colonies for volunteers at the outbreak of the revolution. He was in the expedition against Crown Point, and designed the fortifications erected for the defense of Boston. He was commissioned as asst. engineer and capt., lieut. col. and col. in one year, 1776; served at Ticonderoga, in New York, and elsewhere; and resigned 1782.

BALDWIN, JOHN DENISON: author: 1809, Sep. 28—1883, July 8. His early life was a struggle for education, and having a religious tendency he entered the church, and became pastor of the Congl. church at N. Branford,

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Conn., 1833. At the same time he contributed to magazines and newspapers, became an authority on American archæology, and edited the *Hartford Charter Oak* and *Boston Commonwealth*; and from 1859 was owner and editor of the *Worcester Spy*. He was a member of congress from 1863 during three terms. He wrote *Prehistoric Nations* (1869), and *Ancient America* (1872), the latter esteemed as a lucid exposition.

BALDWIN, LOAMMI: soldier: 1745, Jan. 21—1807, Oct. 20; b. Woburn, Mass. He was educated at Harvard, studied engineering, and became a surveyor. He joined the continental army as major, and was in the battles of Lexington and Long Island, and at Trenton, 1776, Dec. 25, when Washington surprised the Hessians. He was promoted col., but resigned 1777 on account of ill health. He became sheriff of Middlesex co., Mass., 1780, and held that office 14 years. He was a member of the state legislature 1778–81, and supt. of the Middlesex Canal 1794–1804.—His son, LOAMMI B. (1780, May 16—1838, June 30), b. Woburn, Mass., was an engineer, and he constructed the dry-docks at Charlestown and Newport.—Another son, JAMES FOWLE B. (1782, Apr. 29—1862, May 20), b. Woburn, Mass., was engaged in railroad and water-works engineering, and devised the plan for the Boston water-works.

BALDWIN, MATTHIAS WILLIAM: locomotive builder: 1795. Dec. 10—1866, Sep. 7; b. Elizabethtown, N. J. His father was a carriage-maker, who died in poor circumstances, leaving a widow and five children, and Matthias at the age of 16 was apprenticed to a jeweler in Frankford, Penn. He showed unusual artistic capacity and originality, but soon left this trade and engaged in making bookbinders' tools, and engraving cylinders for calico printing. He also invented and patented a very successful gold-plating process. He began the construction of locomotive engines 1830, and placed his first one, 'the Ironsides,' on the Philadelphia and Germantown railroad, 1832, Nov. 23. In 1835 he established the Baldwin Locomotive Works, in which he made about 10 engines in the first 3 years; and before his death he had sent out of his shops 1,500 locomotives, and had acquired fame in many lands. B. introduced many improvements in construction, notably the flexible truck locomotive, patented 1842. He gained large wealth, interested himself in horticulture and the fine arts, and contributed liberally to churches and charities. He was a member of the Penn. legislature, 1853.

BALDWIN, ROGER SHERMAN: statesman: 1793, Jan. 4—1863, Feb. 19; b. New Haven, Conn.; of old Puritan stock; son of Simeon B., and on his mother's side, grandson of Roger Sherman. He graduated at Yale 1811; studied law in his father's office, and at the law school in Litchfield, Conn.; and was admitted to practice 1814. He became at once noted for eloquence and skill before a jury, also for never undertaking a case unless convinced of its justice. He appeared in many important trials, and was associated with John Quincy Adams in the celebrated

BALDWIN—BALE.

case of the 'Amistad captives,' 1839, in which the claim of property in slaves adrift on the high seas was in question. His conduct of this case showed legal ability of the highest order. He was elected to both houses of the legislature of his state, was gov. 1844 and the succeeding term, and U. S. senator 1847. He was one of the presidential electors 1860; and was appointed a member of the peace congress 1861 to negotiate with the southern seceding states, which failed of result.

BALDWIN, THERON, D.D.: educator: 1801, July 21—1870, Apr. 10; b. Goshen, Conn. He graduated at Yale College 1827, studied theology in Yale Divinity School, and went West as a Congl. home-missionary. He was for two years pastor at Vandalia, Ill.; was appointed Congl. home-missionary agent for the state; and entered with zeal into providing educational facilities. He procured the charter for Illinois College at Jacksonville, and founded the Monticello non-sectarian female college (Godfrey, Ill.), opened 1838, of which he was principal for five years. For 27 years as sec. of the soc. for promoting collegiate and theological education, Dr. B. did a work not surpassed by any other man in providing the higher educational facilities for the then new West. The latter part of his life was passed in Orange, New Jersey.

BALDWIN'S PHOSPHORUS: the nitrate of lime, which, on evaporation, parts with its water of crystallization, and then, as discovered by Baldwin, 1675, assumes a luminous appearance in the dark.

BALE, n. *bāl* [F. *balle*; Sw. *bal*; It. *balla*, a pack of goods: Dut. *baal*, a bag]: a bundle or package of goods. BALE, v., to form into bales. BALING, imp. *bāl'ing*. BALED, pp. *bāld*. BAL'ING, n., the act or process of putting goods into bales.

BALE, v. *bāl* [Sw. *balja*; Dan. *balle*; Dut. *baalien*, to empty out water with a pail: *baile*, a tub]: to free from water by lifting it out in small quantities at a time, by means of a ladle or scoop, as from a boat. BA'LING, imp.: N. the act of freeing from water, as a boat. BALED, pp. *bāld*.

BALE, n. sorrow; evil: see under BALEFUL.

BALE—BALEARIC.

BALE, *bāl*, JOHN, Bishop of Ossory, in Ireland: 1495, Nov.—1563; b. at Cove, Suffolk, Eng. He was educated as a Carmelite monk, turned Protestant, renounced his monastic vows, and married. He was saved from the active hostility of the clergy only by the powerful protection of Thomas Cromwell. He wrote a number of moralities or scriptural plays, in which he attacked the Roman party with much more vigor than decorum. On the downfall of his patron he fled to Germany, but was recalled by Edward VI., and successively presented to the living of Bishopstoke, in Hampshire, and the bishopric of Ossory. In Ossory he made himself so obnoxious to the Rom. Catholics by his zeal in the Protestant cause, that on news of the death of Edward, his house was attacked, and he escaped from the country with great difficulty. On the accession of Elizabeth he returned to England, and was made a prebendary of the Canterbury cathedral. B. had great learning, but his controversial works are marred by a coarseness and bitterness that enraged his antagonists, and earned for himself the name of the 'bilious Bale.' A few of his plays are printed in Dodsley's 'Old Plays' (last ed., that by W. C. Nazlitt, 15 vols., 1874-76); the best, *Kynge Johan*, was printed by the Camden Soc., 1838. His most valuable work was a kind of history of English literature, *Illustrium Majoris Britanniae Scriptorum Summarium*, pub. 1548.

BÁLE: see BASEL.

BALEARIC, a. *bāl-é-ār'ík* [L. *balēārēs*—from Gr. *balleîn*, to throw—the inhabitants being good slingers]: of or relating to Majorca and Minorca, islands in the Mediterranean Sea.

BALEARIC CRANE—BALFE.

BALEARIC CRANE, n. *bāl-é ār'ik krān*: the Crowned Crane, *Balearica pavonina*, found in the Balearic Islands and in n. Africa. Its occiput is ornamented with a tuft of yellowish filaments or feathers tipped with blackish hairs. Its voice is like the sound of a trumpet.

BALEARIC ISLES, *bāl'e-ār'ik*: group of five islands—Mallorca (Majorca), Minorca, Iviza, Formentera, Cabrera—off the coast of Valencia; lat. 38° 4'—40° 5' n., long. 1°—5° e. They at one time formed the kingdom of Mallorca, united, 1289, with the crown of Aragon. They now form a Spanish province; 1,753 sq. m. The soil generally is good. Vines, olives, and other fruit-trees are cultivated abundantly; but corn has to be imported. The coasts are precipitous, with some excellent harbors—Port Mahon, in Minorca, being one of the finest in Europe. The Phœnicians visited the Balearic Isles at a very early date, and they were followed by the Greeks. The name was said to be derived from the Greek *ballein*, to throw, because of the expertness of the natives in using the sling, to which they were trained from infancy. Later, the Balearic Isles became subject to Carthage; but after a short period of freedom, during which their inhabitants became pirates, were annexed to the Roman empire by Metellus (Balearicus), B.C. 123, since which their history is involved in that of the peninsula. See SPAIN. Pop. (1900) 311,649.

BALECTION, a. *ba-lēk'shūn*, or **BOLEC'TION**, *bō-* [etymology not obvious]: projecting. **BALECTION MOLDINGS**, n., in *arch.*, projecting moldings, situated around the panels of a framing.

BALEEN, n. *bāl-lēn'* [L. *balæna*, a whale]: the horny plates which occupy the palate of the true or whalebone whales; whalebone.

BALEFUL, a. *bāl'fūl* [AS. *bealo*, torment: Icel. *bōl*, calamity]: mischievous; malignant; destructive; sorrowful; poisonous. **BALE'FULLY**, ad. *-lī*. **BALE'FULNESS**, n. the state or quality of being baleful. **BALE**, n. *bāl*, in *OE.*, grief; trouble; sorrow; poison. **BALE-FIRES**, fires warning of misfortune; beacons. See **BEACON**.

BALFE, *bālf*, MICHAEL WILLIAM: 1808, May 15—1870, Oct. 20; b. Dublin: English composer of operas, etc. When only seven years old, he played publicly one of Viotti's concertos for the violin. At nine, he wrote the ballad entitled *The Lover's Mistake*, which achieved popularity through the singing of Madam Vestris. At sixteen, he made his début in London, at the Drury Lane Theatre, as conductor of the orchestra. In 1825, going to Italy, he studied counterpoint under Frederici at Rome, and singing under Felippo Galli at Milan, and composed music for the ballet *La Peyrouse*, performed at the Theatre La Scala, Milan. In 1827, he returned to the stage, and sang in the Italian opera at Paris, where, with Malibran and Sontag, he gained great applause. Returning to Italy, he composed in rapid succession the operas—*I Rivali* (1829), *Un Avvertimento* (1830), *Enrico IV.* (1831), *Siege of Rochelle* (1836), *Maid of Artois* (1836), *Joan of Arc* (1837), *Falstaff* (1838),

BALFOUR.

Keolanthe (1841), *The Bohemian Girl* (1843), *Les Quatre Fils Aymon* (1844), *The Bondman* (1846), *The Maid of Honor* (1847), *The Sicilian Bride* (1852), *The Rose of Castile* (1857), *Blanche de Nevers* (1860), *The Puritan's Daughter* (1861), *The Armorer of Nantes* (1863), and others. *Il Talismano* first saw the light 1874, June, nearly four years after B.'s death; it is perhaps his greatest work. Of the others named, *The Bohemian Girl* and *The Rose of Castile* have been most permanently successful. Though B. may be deemed not very original, he had thorough knowledge of effect and command of orchestral resources; and his compositions are distinguished by fluency, facility, and melodic power. See Kenney's *Memoir of Balfe* (1875), and Barrett's *Balfe: His Life and Work* (1882).

His dau., Mdlle. VICTORIA BALFE—who became Duchess of Frias in Spain (d. 1871)—was for some years a very acceptable public singer in England and on the continent.

BALFOUR, *bäl'fôr* or *bäl'fur*, ARTHUR JAMES, LL.D.: chief sec. for Ireland: b. England, 1848: nephew of the Marquis of Salisbury. He was educated at Eton and Trinity College, Cambridge; was member of parliament for Hertford 1874-85; private sec. to his uncle while foreign minister and delegate to the Berlin Congress 1878-80; elected to parliament for E. Manchester 18-5-6; appointed sec. for Scotland 1886, July; and after serving in that office a few months became chief sec. to the lord-lieut. of Ireland, succeeding Sir Michael Hicks-Beach. He was pres. of the local govt. board 1885-6; pres. of the royal commission on gold and silver currency 1886; was elected lord rector of St. Andrews Univ. 1887; and received his degree from Edinburgh Univ. In 1886 he introduced in parliament the celebrated 'Crimes Act,' and since its adoption he has applied himself to the enforcement of its provisions with great energy. 1890, Mar. 24, he introduced in parliament a bill for the purchase of land in Ireland. He was first Lord of the Treasury 1891-92, 1895; succeeded the Marquis of Salisbury as Prime Minister, 1902, July.

BALFOUR, Sir JAMES: d. 1583: son of Sir Michael B. of Pittendreich and Montquhany, Scotland. In early life he was implicated in the conspiracy against Card. Beaton, and 1547 was taken prisoner to France in company with John Knox. He returned 1549, changed his religion, and began receiving unusual honors and emoluments from the queen and court. Gaining the confidence of Bothwell, he joined the conspiracy against Darnley, drew up the mutual bond of support of the conspirators, and was accused as an accomplice in Darnley's murder, but never tried. In 1567 he was appointed gov. of Edinburgh Castle, and after various deeds of treachery toward Bothwell and the queen, surrendered the castle to Murray on conditions of personal aggrandizement. He espoused the cause of the regency, and was rewarded by being made a privy councilor, commendator of the priory of Pittenweem, and lord pres. of the court of session. He fled to France several times and was instrumental in procuring the death of Morton, who had befriended him while regent, 1580. He published *Practices of Scots Law*.

BALFRUSH—BALIOL.

BALFRUSH, *bāl-frūsh'* (or more correctly **BARFURUSH**, *bār-fūr-ūsh'*, 'mart of burdens'): important commercial town in the Persian province of Mazanderan; on the river Bahbul, about 12 m. from its mouth in the Caspian Sea. The river is here about 50 yds. broad, but shallow, is crossed by a fine stone bridge of eight arches. It is not navigated, all goods being landed at the port of Mesh-hedi-Ser, on the Caspian, whence they are conveyed to B. by an excellent road. To the s. of the town there is an artificial island, about half a mile in circumference, on which the palace of Shah Abbas formerly stood. B. has excellent bazaars, and several Mohammedan colleges. Flax and cotton are much cultivated in the vicinity. Pop. variously estimated, 50,000 to 200,000, the latter by Fraser, who visited it 1822, since which time it has been greatly depopulated by plague and cholera.

BALI, *bālē*: island e. of Java; 2,300 sq. m. B. is volcanic—its highest mountain, 12,379 ft., having been an active volcano as late as 1843. Agriculture is the chief employment. The inhabitants grow rice, indigo, cotton, fruits, maize, and edible roots, and have buffaloes and cattle. Fish is plentiful. Coffee culture is extending; and of late its export from Bolélêng, the trading capital, reached upwards of 20,000 cwts., valued at \$300,000. B. is well situated for trade. The Balinese are a superior race, and speak a language related to Javan. They excel as sculptors, and in working gold, silver, and iron. Their religion is Brahmanism. Under the Dutch, the eight kingdoms are governed by native rulers. Chinese and a few Europeans are the chief traders. Pop. (1900) about 431,696.

BALIOL, *bāl'ī-ol* or *bāl'yol*, **JOHN**, Lord of Galloway, afterwards King of Scotland: 1259–1314: on the death of the Princess Margaret, 1290, became a competitor for the crown of Scotland. As the grandson of the eldest dau. of David, Earl of Huntingdon, brother of William the Lion, his claim was pronounced superior to that of the other principal competitor, Robert Bruce, Lord of Annandale, son of the second daughter. The arbiter on the occasion was Edward I. of England, who found this a fit opportunity for asserting his claim as lord-paramount of Scotland. That claim was acknowledged by the Scottish estates in submitting the contest to his decision; and, consistently with this ignominious submission, B., before and after receiving the crown (1292, Nov. 30) swore fealty to Edward as his feudal superior. Abject as he had shown himself, the indignities which he experienced at length roused him to assert his right as king, and, 1295, he took upon him, by the advice of his nobles, to make alliance with France, then at war with England. This act of revolt was followed by speedy chastisement. Edward invaded Scotland with a large force; defeated the Scottish troops; took B. prisoner, and compelled him, after performing a humiliating penance, formally to surrender his crown, 1296, July 2. B. was confined for three years in the Tower, with allowance of a limited freedom, and something of royal state. At the end of that

BALIOL—BALISTES.

time, he was permitted to retire to his patrimonial estates in Normandy, where he died a short time after the battle of Bannockburn. The estimate by his subjects of this prince was indicated by the surname 'Toom Tabard,' or Empty Jacket.

BALIOL, EDWARD, King of Scotland: son of John: d. 1363: transiently conspicuous by his daring and successful invasion of Scotland, then under the regency of Randolph, Earl of Moray, 1332. Accompanied by some English noblemen bent on recovering their forfeited estates in Scotland, he landed with a few hundred followers at Kinghorn, Fifeshire; defeated the Earl of Fife; pushed boldly into the country; and on Dupplin Moor, Perthshire, routed with immense slaughter an army upwards of ten times as numerous as his own. On Sep. 24, seven weeks from the date of his landing, he was crowned king of Scotland at Scone. Only about three months afterwards, he was surprised in his camp at Annan, and nearly lost his life as well as his crown. His subsequent career is the very reverse of what might have been anticipated from so adventurous a beginning, being marked only by weakness, servility, and misfortune. He died at Doncaster, and with him ended the house of Baliol.

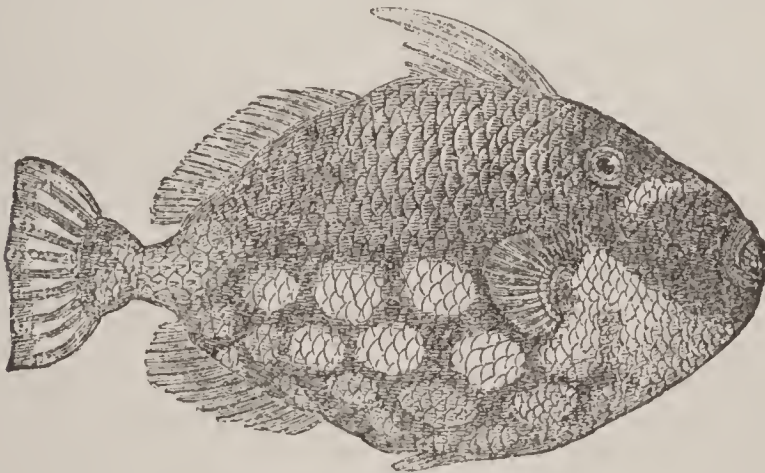
BALIOL COLLEGE: see BALLIOL COLLEGE.

BALISAUR. n. *bāl'ī saur* [appar. fr. Gr. *balios*, spotted; *sauros*, a lizard]: an Indian mammal (*Mydaus collaris*), allied to the badger.

BALISTA: see BALLISTA.

BALISTER, or BALLISTER, n. *bāl'is-tēr*: see BALUSTER.

BALISTES. *ba-līs'tēz*, or TRIGGER FISH: genus of osseous fishes of the order *Plectognathi* (q.v.) of Cuvier; the type of a family, *Balistidæ*, the species of which are inhabitants



Balistes conspicillum.

mostly of tropical and subtropical seas, frequenting rocky coasts and coral-reefs. Their colors are generally brilliant. The body is remarkably compressed. The ossification of the skeleton, as in the other *Plectognathi*, is very incomplete, and the external covering of the body resembles that of the Ganoid (q.v.) fishes, consisting, in some of the

BALISTRARIA—BALK.

genera, of large rhomboidal scales, disposed in regular rows, and not overlapping; in others, of very small rough scales, with stiff bristles, as densely crowded as the pile of velvet. But the most interesting thing in connection with these fishes is the provision for fixing the first dorsal spine in an erect position, or lowering it at the will of the animal. The spine is articulated 'by ring and bolt to the broad interneural osseous plate.' 'When the spine is raised, a depression at the back part of its base receives a corresponding projection from the contiguous base of the second ray, which fixes it like the hammer of a gun lock at full cock, and it cannot be let down until the small spine has been depressed, as by pulling the trigger; it is then received into a groove on the supporting plate, and offers no impediment to the progress of the fish through the water. This trigger-like fixing of the spine takes place also in the dead fish; and when a B. is removed from the bottle for examination, it is generally necessary to release the spine by pressing on the small trigger-ray.' The spine is roughened with enamel grains, whence the name File-fish. The flesh of these fishes is generally regarded as unwholesome.

BALISTRARIA: see BALLISTRARIA.

BALIZE, n. *ba-līz'* [Fr. *balise*, a sea-mark, a buoy—from L. *palus*, a pale]: a pole raised on a bank to constitute a sea-beacon; a sea-mark.

BALIZE, BELIZE, *ba-līz'*, or BRITISH HONDURAS: British colony on the Bay of Honduras, in the Caribbean sea; n. lat. from 16° 45' to 18° 30', w. long. from 88° 10' to 89°; 13,500 sq. m. It is the s.e. part of the peninsula of Yucatan, which here divides the Caribbean Sea from the Gulf of Mexico. The Balize river traverses the middle of the country for about 200 m., and the Rio Hondo and Siboon form respectively the n.w. and s.e. boundaries. The early British settlers were frequently attacked by the Spaniards; but since 1798, when they repulsed a fleet and land-force of 2,000 men, their occupation has been formally acquiesced in. Since 1862, B. has ranked as a British colony, and has had a governor and local magistrates. The country has a general tropical fertility, but its chief exports are mahogany, sugar, coffee, cotton, india-rubber, and logwood with other dye-stuffs. Pop. (1891) 31,471, of which abt. 500 white.

BALIZE, the cap., at the mouth of the B. river, is a depot for British goods for Central America: pop. varying from 8,000 to 15,000.

BALK, v. *bawk* [Icel. *balkr*, a division between stalls: Sw. *bal/ka*, to partition off; *balk*, a hewn beam: Ger. *balken*, a beam, separation]: to separate by beams; to partition off; to pass over in plowing; to cause another to miss the object of his expectation; to disappoint; to frustrate: N. a slip or ridge of land left unplowed; a beam; sudden disappointment. BALK'ING, imp. BALKED, pp. *bawkt*. BALK'INGLY, ad. BALKS, n. the rafters. BALK'ER, n. one

BALKAN.

who signals to the fishermen the course of the herring-shoals.—SYN. of 'balk, v.': to disappoint; battle; defeat; disconcert; confound; frustrate; discompose; foil.

BALKAN, *bál-kán'*, or HÆMUS, *hē'mūs*: eastern branch of the mountain-system which comprehends the ranges of Montenegro, Herzegovina, and the Dinaric Alps. It extends from the plain of Sophia to Cape Eminch, on the Black sea, and forms the s. boundary of the basin of the Danube, from 1878 till 1885 dividing Bulgaria from eastern Roumelia. Its highest summit, Tchat-al-dagh, is 7,876 ft. above sea-level; but the general height of the range is abt. 4,000 ft. Towards the Black Sea, the mountains become lower and diversified with wooded slopes. They send several offshoots n. and s., and are of great strategical importance in the defense by Roumelia. The chief route across them is that of Trajan's Gate, which connects Constantinople with the w. of Europe. The attempt by the Turks to regain possession of the Shipka Pass in the Balkans was one of the fiercest contests of the war of 1877.

BALKAN' PENINSULA: peninsula in s.e. Europe, bounded e. and w. by the Archipelago and the Adriatic, n. by the Save and the Danube: though Greece forms the s. extremity of the peninsula, it is not reckoned as one of the Balkan states. In general, the B. P. and the Balkan states cover the area of European Turkey, with the non-Turkish states now or formerly under Turkish rule, except Roumania and Greece.

The B. P. is peopled by very diverse races. The oldest inhabitants, the Illyrians, are represented by the Albanians; there is a Greek element; the Rumans or Roumanians are descendants of the anc. Dacians; the Slavonians are a large and important element. Of the Turanian element, the Bulgars are now thoroughly Slavonized. Finally, there are Ottoman Turks. Other races form less considerable contingents of the population.

According to Reclus, the present territory of the peninsula may be divided into four ethnological zones: (1) Crete and the islands of the Archipelago, the seaboard of the Ægean, the e. slope of Pindus and of Olympus, are peopled by Greeks; (2) the space between the Adriatic and Pindus is the country of the Albanians (Skiptar); (3) on the n.w., the region of the Illyrian Alps is occupied by Slavs, known as Serbs, Croats, Bosnians, Herzegovinans, and Chernagorans (Montenegrians); (4) the two slopes of the Balkans proper, the Despoto-Dagh, and the plains of e. Turkey belong to the Bulgarians—a Slavonized Turanian people, now practically Slavs. The Turks themselves are scattered here and there in more or less considerable groups, chiefly round the cities and strongholds; but the only extensive tract of country of which they, ethnologically speaking, are possessors, is the s.e. angle of the peninsula. In 1885 the statistical bureau in Belgrade reckoned that in European Turkey (*without* Roumania, Servia, or Montenegro) there were 1,362,000 Turks—not pure Osmanli, but largely de-

BALKASH—BALKH.

scended from renegade Greeks and Bulgarians; 1,137,000 Greeks; 1,011,000 Albanians, 200,000 Walachians; 1,388,000 Serbs; 2,877,000 Bulgarians, of whom 860,000 are Mohammedans; 100,000 Armenians; 70,000 Jews; 104,000 Gypsies; and 144,000 Circassian immigrants.

The following table is compiled from official returns:

POLITICAL DIVISIONS.	Area: sq m.	Pop.
Immediate possessions:		
Europe	65,752	6,063,300
Asia ..	650,394	17,545,300
Africa	398,900	1,300,000
	1,115,046	24,931,600
Bulgaria (including Eastern Roumelia) au- tonomous	37,860	3,733,189
Bosnia, Herzegovina, and Novibazar—under Austria-Hungary.....	23,570	1,591,036
Crete	3,326	309,253
Samos—tributary principality	180	54,834
Egypt.....	400,000	9,821,045
	464,936	15,509,357
Total.....	1,579,982	40,440,957

BALKASH, *bál-kásh'* or **TENGİZ**, *ten'gēz* (Tenghíz or Tenguíz): lake near the e. borders of Russian Central Asia; lat. 45° to 47° n., long. 75° to 79° e. Its length is stated at about 300 m., and its greatest breadth 75 m. Its principal feeder is the river Ili. It has no outlet.

BALKH, *bálk*: district of Afghan Turkestan; the most northerly province of Afghanistan; corresponding to ancient Bactria (q.v.): between lat. 35° and 37° n., long. 64° and 69° e.; bounded n. by the river Oxus, e. by Badakshan, s. by the Hindu-Kush, and w. by the Desert; length 250 m., breadth 120 m. Offsets of the Hindu-Kush traverse it in a n.w. direction, and slope down to the low steppes of Bokhara. Its situation was important during the overland commerce between India and eastern Europe before the sea-route by the Cape of Good Hope was followed. The soil has the general characteristics of a desert land; only a few parts are made fertile by artificial irrigation; and such are the vicissitudes of climate, that where grapes and apricots ripen in summer, and the mulberry-tree permits the cultivation of silk, in winter the frost is intense, and the snow lies deep on the ground. The natives are Usbegs (q.v.), whose character differs in different districts. B. was for some time subject to the Khan of Bokhara. Pop. not known, estimated abt. 1,000,000.

BALKH, long the chief town, 23 m. from the Amu, is situated where the Rudi Haaj is distributed in numerous canals. It is surrounded by a mud wall; but though bearing the imposing title of 'mother of cities,' it has not in recent times had any of the grandeur of ancient Bactra, on the site of which it is built. It was twice destroyed by Genghis Khan and Timur. A terrible outbreak of cholera, 1877, caused the cap. of Afghan Turkestan to be transferred to Mazar, w. of B.; since when, B. is an insignificant village, though its position on the boundary gave it importance in the British-Afghan war.

West of Balkh are the petty Usbeg states of Maimana,

BALL.

Andkhui, Akcha, and Shabir-kan, all absolutely ruled by Kabul, except Andkhui; east of B., between it and Badakshan proper, are the towns and khanates of Kunduz and Khulm. All these Usbeg khanates are in the basin of the Amu Darya, and together with Wakhan e. of Badakshan, constitute Afghan Turkestan.

BALL, n. *bawl* [F. *balle*, a ball: It. *palla*, a globe; *balla*, a bale: Sp. *bola*; L. *pila*, a ball: Icel. *böllr*, a globe or ball]: a round body; a globe; a bullet; a child's toy: V. to form into a ball. BAL'LING, imp. BALLED, pp. *bawld*. RALLER, n. *bawl'er*, one who makes up thread into balls. BAL'LET, *dim.*, in *her.*, a kind of bearing in coats of arms, consisting of bezants, plates, hurts, etc., distinguished from each other by their color. BALL-COCK, a hollow metal globe attached to the end of a lever which regulates the supply in a cistern, by floating on the surface of the water. BALL AND SOCKET, a joint in which a rod fits by a rounded end into a socket so as to be movable in any direction, very useful in scientific instruments, etc. BALL-CARTRIDGE, a cartridge having a bullet besides powder.—SYN. of 'ball, n.': globe; sphere; orb; orbit; circuit; circle.

BALL, n. *bawl* [OF. *bal*, a dance, a ball—from *baler*, to move or stir: mid. L. *ballārē*, to move backwards and forwards: Gr. *ballizō*, I leap or bound—from *ballō*, I throw: It. *ballārē*, to shake or jog]: an entertainment of dancing. In the United States, balls have not been so thoroughly systematized and classified as in England, though the customs and etiquette concerning them are similar. In England there are county balls, attended by the gentry of the shire or county, military balls, court balls, subscription balls, besides balls on various festive occasions. Whether designated balls or assemblies, these entertainments are conducted with great decorum, according to certain established usages. If of a general kind, it is expected that those who avail themselves of tickets shall be of undoubted respectability; and, as a further voucher of propriety, a number of lady-patronesses (married ladies of distinction) take a lead in the management, and dignify the assembly by their presence. Ordinarily, the charge for gentlemen's tickets at subscription balls is at least two-thirds higher than those for ladies. According to etiquette, no unmarried lady can attend a ball unless she accompany a gentleman, or a married lady. All, of both sexes, are expected to be in full dress—anything else would be held disrespectful. Fancy balls are entertainments at which every person attending is expected to be in a fancy or peculiar national costume; in other respects, they are conducted like ordinary balls. Masked balls, formerly common, have, for obvious reasons, lost their repute. At all high class balls, there is an appointed master of the ceremonies, or 'director,' who superintends the proceedings, and, in the event of there being no program, prescribes the dances.

BALL, in Gunnery: term sometimes indefinitely applied to all kinds of shot and bullets. This was especially the case when nearly all such projectiles were solid and spher-

BALL.

ical, before the era of hollow and spheroidal shells, and elongated missiles. At present, when the varieties are so numerous; it is more usual to employ the terms BULLET and SHOT (q.v.). These, together with SHELL, are subdivided into numerous kinds (see the various titles). A particular class of spherical combustibles is described under BALLS, HOLLOW. For BALL-CARTRIDGE, see CARTRIDGE.

BALL, GAMES OF: favorite exercises in ancient as well as in modern times. They were played almost daily by young and old; by the highest statesman equally with the lowest of the people. The Greeks prized the game as a means of giving grace and elasticity to the figure, and erected a statue to one Aristonicus for his skill in it. The luxurious Mæcenas amused himself during a journey by playing B., as we learn from Horace. In the gymnasia of the Greeks, and in the Roman baths, there was a special compartment for ball-playing (*sphæristerium*), where certain rules and gradations of the exercise were to be observed according to the state of health of the player. The balls were of very various kinds; they were generally of leather, and filled with air; others were stuffed with feathers. Ornamented balls, of 12 differently colored segments (such probably as are to be seen in modern toy-shops), are mentioned in Plato's *Phædon*. There was great variety in the kinds of game, each having a name. In one, the B. was thrown up, and the players strove who would catch it; another was the same as our foot-ball; in a third, a number of persons threw it at one another, either with a view to hit, or for the B. to be caught and returned; in a fourth, the B. was kept rebounding between the earth and the palm of the player's hand as long as possible.

Ball-playing seems to have been of equal antiquity in the west of Europe, and to have come down uninterruptedly to modern times. In the 16th c., it was in great favor in the courts of princes, especially in Italy and France. The French *jeu de paume*, and the English *Tennis* (q.v.), are often mentioned. Houses were built for playing in all weathers; and in gardens and elsewhere long alleys were laid out for the purpose, the names of which still adhere to many localities. The B. was struck with a mallet—It. *maglia*; Fr. *mail* or *maille*; Eng. *mall*. The mallet was also called by the compound name *pail-mail*, *pell-mell*, or *pill-mall*, from It. *palla* (Lat. *pila*), a ball. The same names signified both the game and the alley where it was played; hence the English Malls and Pall-Malls. The game is thus described in *Blount's Glossographia*, quoted in Cunningham's *Hand-book of London*:

‘Pale Maille (Fr.), a game wherein a round bowl is with a mallet struck through a high arch of iron (standing at either end of an alley), which he that can do at the fewest blows, or at the number agreed on, wins. This game was heretofore used in the long alley near St. James's, and vulgarly called Pell-Mell.’

Towards the end of the 18th c., the game of B. ceased to be played at courts, and at the same time went out of fashion in the higher circles of continental society, though

BALLACHULISH—BALLAD.

still practiced by the people in Spain and Italy. The Ball-games called *Cricket* (q.v.), *Golf* (q.v.), *Foot-ball* (q.v.), *Fives* (q.v.), *Lawn-tennis*, *Polo*, etc., are more or less practiced throughout Great Britain; and Foot-ball and Lawn-tennis are very popular in the United States, where Baseball (q.v.) largely takes the place of Cricket, and is often called the National Game.

Ball-playing is among the best gymnastic exercises. Ancient physicians were in the habit of prescribing a course of balls to their patients where many modern doctors might prescribe *pills*.

BALL, THOMAS: sculptor: b. Charlestown, Mass., 1819, June 3. In his early years he sang in public in oratorios. He began his art career in Boston as a portrait painter; then took up sculpture, among his works being a miniature bust of Jenny Lind, a statue of Webster, and busts of other celebrities. He lived abroad for many years, producing imaginative pieces, such as *Truth*, *Pandora*, and the *Shipwrecked Sailor-boy*. On his return to America, he settled in Boston, where he gave much of his time to portrait busts and statuettes, besides modelling an equestrian statue of Washington for the city of Boston. Among his later works are his group *Emancipation*, (the original in Washington, a replica in Boston), *Eve* Forrest as *Coriolanus*, statues of John A. Andrews, Charles Sumner, Josiah Quincy, Daniel Webster—the latter placed at a cost of \$60,000, in Central Park, New York.

BALLACHULISH, *bá-lá-kó'ísh*: village, partly in Argyll, partly in Inverness shires, Scotland, on the s. side of Loch Leven. Its great quarries of blue roofing clay-slate, wrought since previous to 1760, employ about 600 men. The annual product in a busy year is 17,000,000 roofing-slates. Pop. of village (1891) 1,045.

BALLAD, n. *bál'lăd* [F. *ballade*, a song: It. *ballata*, a song sung in dancing: Prov. *balada* (see BALL 2)]: a simple popular song containing a tale. **BALLADRY**, n. *bál'lăd-rĭ*, the subject or style of ballads. **BALLATRY**, n. *bál'ăt-rĭ*, in *OE.*, a song; a jig. **BALLAD SINGER**, one who sings ballads. **BALLAD-MONGER**, a contemptuous epithet for a composer of ballads. **BALLAD-THEORY**, a theory which accounts in the prevalence of belief in certain unsupported historical narratives by assuming that they may have been derived from old and veracious ballads.

BALLAD: originally a dance-song; but the term has passed through many transformations of meaning, and is now somewhat vaguely applied to a simple, popular, versified narrative. The confusion in the former use of the term is increased by the fact that poems of exactly the same kind were styled sometimes romances, sometimes ballads, sometimes epic or lyrico-epic, or poetic narratives; so that it was left to the caprice of the poet which of these generic names he would give to his production. As early as the 12th c., the Italians gave the title of B. to short, purely lyrical pieces, allied to the sonnet or still more to the madrigal, and which usually had love-sorrows for their subject.

BALLANTRAE—BALLARAT.

Dante has such *ballate*. Akin to these are those French ballads which Molière set himself against, and which fell into disuse. The earliest ballads, as the word is now understood, are those of England and of Scotland, beginning about the 14th c. They so far resemble the Spanish Romances, that the subject in both is narrative and handled lyrically. See LYRIC. The Spanish romance, however, has more of the lyrical element, and is of a gayer cast, reflecting the southern character of the people; while the northern B. took a more earnest, sombre shape, especially among the Danes; though in the north also there are ballads of a cheerful and sportive tone.

As far as subject is concerned, the B. is a species of minor Epic (q.v.). The name is generally applied to a versified narrative, in a simple, popular, and often rude style, of some valorous exploit, or some tragic or touching story. Ballads are adapted to be sung or accompanied by an instrument. They are comparatively short, the story being circumscribed, and not embracing a combination of events, as the plan of the grand epic does. There can be little doubt that the B. has been the first form of poetry among all nations; and that the earlier epics or heroic poems of the higher kind, such as the Spanish Cid and the German Nibelungen, grew out of such simple beginnings. Of the popular B., the borderland of Scotland and England, is allowed to have produced the best examples—as *Cherry Chase*, *Fair Helen of Kirkconnel Lee*, and many others. As a B. of modern composition may be instanced Goldsmith's *Edwin and Angelina*.

Many of the old popular songs of the Germanic nations are simply narratives of epic events and incidents in which the feelings of the composer manifest themselves. But the name of B. was not then in use, and such poetical narratives were called simply songs, or more specifically perhaps *lays* (Ger. *lieder*). It was not till the last half of the 18th c. that the foreign name was transferred to them.

The B. in recent times has been cultivated chiefly by the Germans, and in their hands has assumed a more artificial development. Bürger may be said to be the creator of the modern B. His *Leonore* has become at once classical and popular. Bürger, Schiller, Goethe, Uhland, and Heine are the greatest German names in this department of composition. Following the practice of these writers, it has become common to confine the name B. to an epic narrative with something fabulous and supernatural in the background. In this sense, Goethe's *Erkönig* is a ballad; and Coleridge's *Ancient Mariner* is perhaps the best exemplification in English. Of the ancient English and Scottish ballads there are collections by Scott, Aytoun, and others; the best being Child's *English and Scottish Popular Ballads*.

BALLANTRAE, *bál'·lân-trā'*: fishing village at the mouth of the Stinchar, in the south of Ayrshire; centre of the s.w. fishery dist. of Scotland.

BALLARAT, *bál-la-răt'*: oldest of the *considerable* gold-fields of Victoria, and the oldest but one of all the gold-

BALLAST.

fields of the colony: about 100 m. w. by n. of Melbourne, with which it is connected by railway. It was first worked 1851, Sep.—the comparatively unimportant ground at Anderson's Creek, which dated from Aug. of the same year, having been the earliest result of the 'prospecting' which, a few months previously, had been stimulated by the newly discovered 'diggings' of New South Wales. Though B. was speedily rivalled by Mount Alexander and Bendigo, yet it has not lost its original pre-eminence. As its surface-digging became exhausted, mines were formed—some of them now as deep as average English coal-pits. B. (also spelt *Ballaarat*), or B. West and B. East, separated by a small creek, are separate municipalities. Pop. (1881) B. West 22,425; B. East 16,044: total 38,469; (1891) total 46,043.

BALLAST, n. *bäll'läst* [Dut. *ballast*, ballast: AS. *bat*, a boat; *hlaest*, load: Dan. *bag-lest*, the back load or worthless load]: any heavy substance placed at the bottom of a ship or boat to steady it; the load of sand, stones, etc., which a ship carries when there is no cargo; the gravel, broken stones, etc., placed on the permanent way of a railway, as a packing immediately under and around the sleepers, in order to steady them: V. to load with ballast; to steady. **BAL'LASTING**, imp. **BAL'LASTED**, pp.

BALLAST, in Navigation: heavy substance employed to give a vessel sufficient hold of the water, to insure her safe sailing with spread canvas, when her cargo and equipment lack weight for that purpose. The amount of B. required by a ship depends not only on her size and cargo, but also on her build; some forms of construction requiring more B. than others. It is not merely the *quantity* of B. which a skilful mariner has to consider; he is required also to take into account its *distribution*. If a heavy mass of B. be deposited within a small compass near the keel, it places the centre of gravity very low down; the ship may sail sluggishly, and is said to be 'stiff.' If, on the other hand, the B. be massed too high up, the ship becomes 'crank,' and cannot carry much sail without danger of being upset. Under average circumstances, it is considered that a ship is well ballasted when the water comes up to about the extreme breadth amidships.

In ballasting a ship, the cargo and B. are considered together, the quantity and distribution of the B. being made dependent on the cargo. In a ship of war, the B. is made subservient to the requirements of the necessary stores and war *matériel*; in a merchant or passenger vessel, to the convenience of the passengers and the careful stowage of the cargo. The recent changes in the sizes and shape of vessels, and the introduction of steam-propulsion, have rendered the former rules for fixity of ratio between tonnage and B. inapplicable.

The substances used as B. are various—chiefly iron, stone, gravel, sand, mud, and water. In pleasure yachts of recent construction, lead, run into a considerable length of the keel, is a favorite B. Iron is now superseding stone, gravel, and sand, in ships of any importance; and water-ballast is gradually being introduced in British collier-

BALLAST HEAVING—BALLET.

ships of the Tyne, Wear, and Tees. Before the use of water-ballast, the collier-ships were ballasted, when empty, with material mostly dredged up from the bed of the Thames in and near Woolwich Reach. About 10,000 tons per annum were thus used. Returning to the Tyne, and not allowed to empty the B. in the river, they discharged it on the shore; thus making the vast mounds on the banks of the Tyne, which again have been useful as supplying ballast for the construction of railways. Water-ballast is employed in four different ways. *Bag water* B. is contained in water-proof bags laid on the floor of the vessel, and filled or emptied by means of a pump and a hose. *Bottom-water* B. is confined beneath a false bottom in the vessel. *Hold-water* B., first employed in screw-steamer colliers constructed by Scott Russell, is contained in a large receptacle, which may be filled with the cargo when the ship is not in B. *Tank-water* B. is contained in two fore-and-aft tanks, which can easily be filled and emptied.

BALLAST HEAVING: transferring ballast dredged from the beds of rivers, to the holds of ships empty of cargo, and discharging it again at some other port. As this has effect on the navigable channel, it is usually regulated by law.

BALLATER, *bál'la-tér*: village of Aberdeenshire, Scot.; on the banks of the Dee; 36 m. w.s.w. of Aberdeen. It is remarkable for the resort of numerous visitors to its chalybeate springs. Pop. (1881) 759. ; (1891) 983.

BALLATOON, n. *bál'la-tón*: a heavy luggage boat employed in the transport of timber in Russia.

BALLENY ISLANDS, *bal'le-ne*: group of five small volcanic islands discovered in the Antarctic Ocean, 1839: lat. 66° 44' s., long. 163° 11' e.

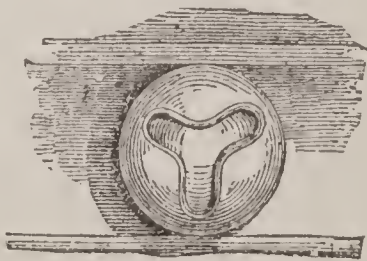
BALLESTEROSITE, n. *bal-lës-tër-ō'sīt* [after *Lopez Ballesteros*]: a mineral, the stanniferous variety of Pyrites. It contains tin and zinc; found in Galicia.

BALLET, n. *bál'lā* [F. *ballet*, a sort of dance: It. *ballo*, a dance; *ballata*, a dance, or song sung when dancing (see **BALLAD**)] a kind of dance; a scena acted in dancing in a theatre, and associated with music; usually an interlude in theatrical performances, principally in operas. Properly, a B. is a theatrical exhibition of the art of dancing in its highest perfection, and must therefore, in general, comply with the rules of the drama as to its composition and form. The pantomimic sacrificial dances of antiquity, although they may be regarded as the source of Attic tragedy, are not to be considered as directly the origin of the ballet. The B., as known to us, undoubtedly originated in the service of the courts. We find it existing in Italy in the beginning of the 16th c., especially at the court of Turin, where it was enriched by the inventive genius of Count Aglio; and where the princes and princesses of the court themselves took part in it, in song and declamation as well as in dance; for the B. at first appeared in combination with the other theatrical arts, and completed the chaotic medley exhibited in these spectacles, at once mythological, allegorical, fantastic, warlike, and pastoral. From

BALL-FLOWER.

these mingled elements the individual species of dramatic entertainments were gradually evolved in their distinct forms. Baltagerini, director of music to Catherine de Medici, was the first to introduce the B. into France, where it soon became such a favorite, that Louis XIII. danced in one of these ballets, and his example was followed by Louis XIV. in his youth. The latter made his last appearance on the stage, 1699, in the B. of *Flora*. Hitherto, the B. had always appeared in combination with the characteristic features of the opera, and even of comedy, as is evident from the works of Quinault and Molière, arranged by Lully. The art of dancing possessed then little dramatic expression, and still required to be introduced and explained by singing and recitation. In 1697, Antoine Houbart de la Motte undertook to reform the B., to which he imparted both dramatic action and the expression of passionate feeling. About this time, women first made their appearance in the B., as well as in plays and operas, till then performed exclusively by men. There is no mention of any female ballet-dancer of note before 1790. About the middle of the 18th c., Noverre separated the B. from the opera, gave it an independent dramatic form, and in his writings laid the foundation of an ingenious theory on the subject. The Mythological B., a relic of the magnificence of Versailles, came to an end during the Consulate, when it gave place to the newly invented Comic Ballets *Dansomanie*, *La Fille mal Gardée*, and the *Arlequinades*. Vincenzo Galeotti, in Copenhagen, carried out the ideas of Noverre so far as to subordinate the dance to purely dramatic principles, instead of giving it the first place as formerly; and thus he gave to his ballets the character of great rhythmical pantomimes. These splendid performances were kept up longest in the theatre of Milan, where the most lifelike and magnificent tableaux were exhibited in pantomime; and subjects were attempted far beyond the limits of the ballet. The story of *Hamlet* was turned into a B., and the subjects of several other tragedies were similarly treated. In general, the B. has now become unfaithful to its original design and its true artistic signification; and exhausts itself in the exhibition of mere feats of bodily agility, tasteless displays of artificial dexterity, distortions of the person almost to dislocation, and balancings of the figure in attitudes often indelicate. Consisting as it does more of external show than internal meaning, it contributes gradually to blunt the public taste for the enjoyment of the legitimate drama, which speaks more to the mind than to the eye.

BALL-FLOWER [named from its resemblance to a ball placed in a circular flower]: an ornament peculiar to the decorated style of Gothic architecture which prevailed in the 14th c. The B.-F. is supposed by some to be an imitation of a pomegranate, by others of a hawk's bell. Its form is shown in the illustration.



Ball flower.

BALLINA—BALLISMUS.

BALLINA, *bál-e-ná'*: seaport town on the confines of Mayo and Sligo counties, Ireland, but chiefly in Sligo; on the Moy, 7 m. s. of its entrance into Killala Bay. The Moy runs through the town, is crossed by two bridges, and separates the two counties. B. proper is on the Mayo side, the Sligo portion being a suburb called Ardnaree. The tide runs up to the town, but the river is not navigable from the sea further than to a mile and a half below B. B. has a brisk trade in agricultural produce, salmon, and cured provisions. Coarse linens and snuff are manufactured here. Many anglers resort to the river Moy and Lough Conn. Killala Bay was the rendezvous of the French invaders, 1798. They landed, and took B., but were, three weeks afterwards, defeated at Killala. Pop. (1881) 5,760. (1891) 4,846.

BALLINASLOE, *bál-lí-na-slō'*: small inland town on the borders of Galway and Roscommon counties, near the centre of Ireland, on both sides of the river Suck—which divides the two counties—8 m. from its confluence with the Shannon; 81 m. w. of Dublin. The Suck at B. is divided into several channels, over which the road from Athlone to Galway is carried by a succession of bridges and causeways 500 yds. long. B. is noted for its great annual fair in October, one of the largest in the kingdom. It is the seat of a poor-law union, and the station of the Galway militia staff. Pop. (1881) 4,772. (1891) 4,642.

BALLINROBE, *bál-in-rōb'*: small town of Ireland, county Mayo, picturesquely seated on the Robe, about 3 m. from its mouth in Lough Mask; about 16 m. s.s.e. of Castle Bar. B. is a seat of petty and general sessions, and has a union workhouse and a barrack. It has a weekly market and two annual fairs. Pop. (1891) 2,408.

BALLIOL COLLEGE, *bál'yol*, Oxford: founded between 1263 and '68 by John de Balliol, father of John Baliol, King of Scotland. The original foundation consisted of 16 poor scholars, and the revenue for their maintenance amounted for many years to only 8d. per week for each. In 1340, the establishment was enriched by benefactions from Sir William Fenton and Sir Philip Somerville, the latter of whom gave the college a new body of statutes. Its most important subsequent benefactors were Bell, Bp. of Worcester, 1566; Will. Hammond, 1575; Peter Blundell's executors, 1615 and '76; Lady Periam, 1620; Warner, Bp. of Rochester, 1667; John Snell, 1677; and Mrs. Williams, 1830. The society consists of a master, 13 fellows, and 24 scholars. The number of members on the books is about 600. The master and fellows enjoy the privilege of electing their own visitor. John Wycliffe was master of this college, 1361; among its scholars have been John Evelyn, and Bradley the astronomer. The Snell Exhibitions for students of Glasgow Univ. attract annually to this college a few distinguished Scottish students. Among these have been Sir William Hamilton, J. G. Lockhart, and Dr. Tait, Abp., of Canterbury.

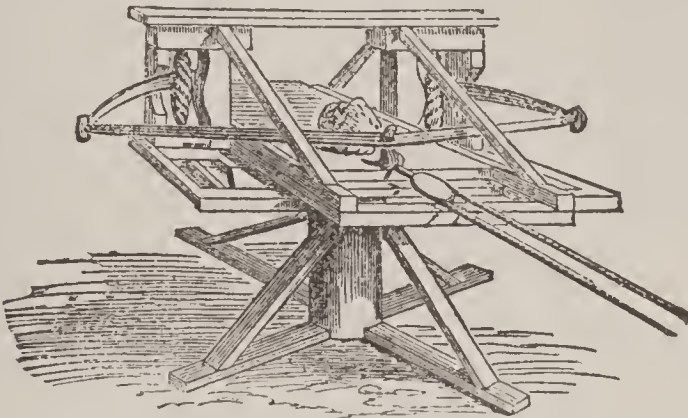
BALLISMUS, n. *bál-líz'mūs* [Gr. *ballismos*, a jumping

BALLISTA.

about, a dancing—from *ballizo*, to throw the leg about, to dance]: a variety of palsy, *Paralysis agitans*, or shaking palsy, of which the symptoms are the trembling of the limbs even when they are supported. When the patient tries to walk he is compelled to adopt a running pace. The disease is a rare one, and generally terminates with death.

BALLISTA, or **BALISTA**, n. *bāl-līs'tă* [L. *ballista*—from Gr. *ballo*, I throw]: a military engine used by the ancients for throwing stones. **BALLISTIC**, a. *bāl-līs'tik*, relating to projectiles. **BALLISTIC PENDULUM**, an instrument for calculating the velocity of projectiles. **BALLIS'TICS**, n. *-tiks*, the art, or the principle underlying the art, of shooting missiles by means of a ballista.

BALLISTA, or **BALISTA**: one among the larger military weapons in use before the invention of gunpowder. The *B.*, the *catapulta*, the *scorpion*, and the *onager* propelled large and heavy missiles, chiefly through the reaction of a tightly twisted rope of hemp, flax, catgut, sinew, or hair; or else by a violent movement of levers. The scorpion was a kind of large crow-bar; the *B.* threw stones; the *catapulta* threw heavy darts or arrows, and was somewhat



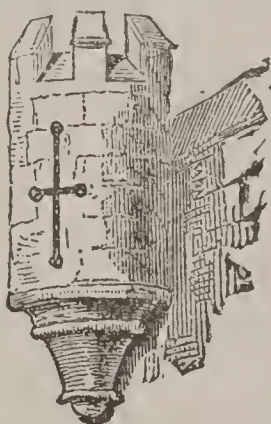
Ballista.

smaller than the *B.* One man could manage the scorpion, but two or more were needed for the *B.* or the *catapulta*. There was much of mechanism necessary to bring about the propulsive force. The makers of those machines were very particular in the choice of women's hair, the sinews of a bull's neck, and the tendons of a deer, wherewith to fashion the elastic cord. The *onager* was a kind of *B.*, which threw a stone by the agency of a sling instead of a stretched cord. The early chroniclers tell of *catapultas* that would throw an arrow half a mile, or hurl a javelin across the Danube; and of a *B.* which threw a stone weighing 360 lbs. Numerous similar weapons were known in the middle ages—such as the *mangonel*; the *trebuchet*, which threw a large stone by the action of a lever and a sling; the *petrari*, which (as its name implies) threw a stone; the *robinet*, which threw darts as well as stones; the *mate-griffon* and *mate-funda*, both slinging machines; the *tricolle*, which hurled quarrels, or square-headed arrows; the *espringal* or *springal*, which threw large darts; the *ribaudequin*, a large kind of cross bow; the *war-wolf*, a stone-

BALLISTIC PENDULUM—BALLON.

throwing machine, etc. The Arbalest (q.v.) may be regarded as a small portable arrow-throwing ballista.

BALLISTIC PENDULUM: instrument for ascertaining the velocity of projectiles, and, consequently, the quality or the force of gunpowder, etc. One, invented by Robins, in the latter part of last c., consists of a large block of wood, suspended from a strong horizontal axis; and it is so solidly constructed as to bear the heaviest blow of the heaviest shot without injury. An excavated centre on one side of the block is filled with sand, packed in leather upon an iron frame; four bags form a filling or core. The core, forming the place of impact, is easily replaced after each firing. Straps of wrought-iron suspend the block from the wrought-iron axis or shaft. The shaft-ends have knife-edges, which rest on V supports. The construction is such, that a violent percussion makes only a very slight oscillatory movement in the block. A brass graduated limb measures the arc of vibration. This in-



Ballistraria.

strument is superseded by the Electro-B. P. of Maj. Navez of the Belgian army (see VELOCITY, INITIAL). For another form of instrument for similar purposes, see EPROUVETTE: for some results of these experiments, see GUNNERY.

BALLISTRARIA, *bal-îs-trâr'î-a* [Ita. *Balestriera*]: one of the names given to those projections with narrow apertures, frequent in the walls of old castles, and through which the cross bowmen discharged their arrows. See BALLISTA. B. do not seem to have come into use till the 13th c. The lower terminations of B. are generally circular, sometimes in the form of a shovel. See LOOPHOLES.

BALLIUM, n. [corrup. of L. *vallium*]: an outer bulwark; the area or courtyard comprised within an outer bulwark. It contained the barracks for the garrison, the chapel, and sometimes other buildings. See BAILEY.

BALLON, n. *băl'lon* [F. *ballon*, a foot ball (see BALL 1)]: a round globe on the top of a pillar; a round short-necked vessel used as receiver in distillation.

BALLOON.

BALLOON, n. *băl-lôn'* [F. *ballon*; Sp. *balon*, a football; It. *ballone* (see BALL 1)]: any round hollow body; a body filled with light gas, so as to rise and float in the air; in *OE.*, a game with ball. **BALLOON'ING**, n. or **BALLOON'RY**, n. the art of ascending in balloons. **BALLOON'IST**, n. in *Amer.*, one who makes balloons or ascends with them; an aeronaut. **AIR-BALLOON**, one raised into the atmosphere by being filled with a gas lighter than air. **FIRE-BALLOON**, one filled and raised by rarefied or heated air produced by placing fire under its mouth.

BALLOON: a round or pear-shaped bag, usually of silk (though it may be of any material combining strength and lightness), filled with a gas lighter than the air. According to the principle of Archimedes (q.v.), bodies immersed in a fluid are buoyed upwards with a force equivalent to the weight of the fluid displaced by them. If their own weight is not sufficient to counterbalance this force—that is, if they are lighter than the fluid—they rise



Balloon.

with a force equal to the difference between the weight of the displaced fluid, and their own weight. A B., therefore, which consists of an integument enclosing a gas, will rise in air in the same way that a cork rises in water, provided that the weight of the whole be less than that of an equal volume of air. If one, for instance, occupy as much space as 1,000 lbs. of air, but weigh itself—covering, gas, and appendages—600 lbs., it will be impelled upward with a force of 400 lbs. The gases employed for filling balloons are either hydrogen or ordinary coal-gas. The former, when pure, is between fourteen and fifteen times lighter

BALLOON.

than atmospheric air, and the latter generally about two and a half.

The B., as it is at present employed, is a large pear-shaped bag, made of any pliable silk cloth, covered with a varnish made by dissolving caoutchouc in oil of turpentine, to render it air-tight. The common size of this bag varies from 20 to 30 ft. in equatorial diameter with a proportionate height. The mouth or neck of this bag is just large enough to enable a man to get inside to make any necessary repairs, and is, of course, turned downwards when the B. is inflated. A network of hempen or cotton twine is accurately fitted to the B., and the separate cords, on which it ends, are tied to a circular hoop placed a few feet below the neck. The car, usually a large wicker-basket, is suspended by ropes from this hoop, and hangs at a considerable distance below, so that the *aéronaut* may be removed from the vicinity of the gas. The network serves to distribute the weight of the car and its charge equally over the whole upper surface of the balloon. One of the most important requisites in the construction is the valve, which is introduced into the top of the balloon. It consists of a wooden clapper, four or five inches square, opening inwards, and kept closed by a sufficient spring. A rope attached to this valve descends through the neck into the car, where, to prevent accidental opening, it is allowed to dangle freely. The equipment of the car comprises the ballast or sand-bags, by emptying which the B. may be lightened; the barometer, or corresponding apparatus for telling the height ascended, or the upward or downward course of the B.; the map and compass, for showing the direction of the voyage; and the grappling iron, tied to the end of a long rope, for anchoring the B. at the descent. The *aéronaut* has at his disposal the means of guiding his airship in only an upward or downward direction, the motion of translation being wholly dependent on the wind by which it is borne. If he wish to ascend, he throws some of the ballast over the side of the car; and if to descend, he pulls the valve-rope, so that, the gas rushing by virtue of its specific lightness through the passage made for it by the open valve, the buoyant material may be lessened. It is evident that the power of thus directing his machine becomes more limited with each exercise of it, for in each case there is an unrepaired loss of the means necessary to it. All attempts at guiding balloons in a horizontal direction have hitherto failed. In ordinary flights, the mouth of the B. is left open, so that there is no danger of explosion arising from the expansion of the gas in the rarer regions of the atmosphere. The diffusion that takes place through the open neck is inconsiderable during the few hours that an *aërial* voyage lasts. Early *aéronauts*, who kept their balloons closed, frequently ran considerable risk by inattention to the valve when the imprisoned gas demanded vent for its expansion.

The art of traversing the air by means of balloons, generally called *Aëronautics*, and sometimes *Aërostation*, is of comparatively recent date. The germ of the invention of

BALLOON.

balloons is in the discovery by Cavendish, 1766, of the remarkable lightness of hydrogen gas, then called inflammable air. Professor Black, of Edinburgh, seems to have been the first who conceived the idea that a light envelope, containing this gas, would rise of itself. He requested Dr. Monro, the professor of anatomy, to give him some thin animal membrane for the experiment, but for some reason or other it was never made. The first practical attempts were made by Cavallo, who, 1772, filled swine's bladders and paper bags with the gas, but found the former too heavy, and the latter too porous; and he succeeded only in raising soap-bubbles inflated with the gas. The invention of the B. is due to the two brothers Stephen and Joseph Montgolfier, paper-makers at Annonay, in France, whose names are as distinguished in the development of their own branch of manufacture as in the history of aëronautics. It immediately struck these brothers, on reading Cavendish's *Different Kinds of Air*, that the air could be rendered navigable by enclosing a light gas within a covering of inconsiderable weight. Led by their avocation, they fixed upon paper as the most fitting material for the purpose, and first attempted to make balloons of paper filled with inflammable air. Finding that these emptied themselves almost as soon as they were filled, instead of abandoning the paper as an unsuitable covering for the gas, they sought after another gas more suited to the paper. By a chain of false reasoning, which need not here be detailed, they thought they found such in the gas which resulted from the combustion of slightly moistened straw and wool, which had, as they imagined, an upward tendency, not only from its being heated, but from its electrical properties, which caused it to be repelled from the ground. It is hardly necessary to say, that this so-called Montgolfier gas possessed no advantages for raising balloons, other than that possessed by heated air of any kind; in fact, the abundant smoke with which it was mixed, by adding to its weight, rather detracted from its merits. At Avignon, 1782, Nov., Stephen Montgolfier first succeeded in causing a silk parallelopiped, of about 50 cubic ft., to rise to the roof of a room. Encouraged by this success, the brothers made experiments on a larger scale at Annonay with an equally happy result; and finally, 1783, June, in the presence of the states of Vivarais, and of an immense multitude, they raised a B., 35 ft. in diameter, to a height of 1,500 ft. This last, nearly spherical in shape, was made of packcloth, covered with paper, and was heated by an iron choffer placed beneath it, in which 10 pounds of moist straw and wool were burned.

The news of this extraordinary experiment soon reached Paris, where it produced a lively impression. A commission was appointed by the Academy of Sciences to report upon it. Public curiosity, however, could not await the tardy decision of this body, and accordingly a subscription was entered into to defray the expense of repeating the Annonay experiment. Such was the excitement that the subscription was filled in a few days, and the construction

BALLOON.

of the B. was intrusted to the brothers Robert, famous philosophical-instrument makers of the day, and to Prof. Charles, a young but experienced physicist. As the detailed account of the Annonay ascent had not reached Paris, and therefore nothing was known of the Montgolfier gas, Charles fixed upon hydrogen as the gas most likely to insure success. It was, however, a formidable undertaking to produce it in sufficient abundance for a B., as it was at that time dealt with only in small quantities in the lecture-room. By ingenuity and perseverance combined, he triumphed over this difficulty, and succeeded in filling, in the course of four days, a silk globe of 12 ft. in diameter. This B. was transferred to the Champs de Mars, the largest open space in Paris, where, 1783, Aug. 27, it ascended in the presence of 300,000 spectators, half the population of the city. At the instance of the commission already referred to, Stephen Montgolfier constructed a fire balloon, 72 ft. high and 41 ft. in diameter. It ascended before the commission, 1783, Sep. 12, but being held captive, it was much injured by a violent wind, which blew at the time, and after it descended it was finally broken up by heavy rains. Another was made of nearly the same dimensions, which ascended on the 19th of the same month at Versailles, the king and royal family 'assisting' at the spectacle. This ascent is worthy of note, from the fact that a sheep, a cock, and a duck were placed in an osier-basket attached to the lower part of the B., and that these first aerial voyagers reached the ground again in safety.

The B. was now a *fait accompli*, and it began to be seriously discussed whether it might not be serviceable as an air-ship for bearing men aloft as passengers. The solution of this question was first given by Pilâtre des Rosiers. In a Montgolfière, as the heated air-balloon was called, 74 ft. high and 48 ft. in diameter, supporting at its base a gallery of wicker-work, he, in company with the Marquis d'Arlandes, made the first aerial voyage, 1783, Nov. 21. They remained in the air 25 minutes, and sailed across the Seine and over a considerable part of Paris. On Dec. 1, Prof. Charles, with Robert, rose from the Tuileries gardens with a hydrogen B.—then called a *Charlière*—made from the proceeds of a public subscription. This B. was made of alternately red and yellow gores of silk sewed together, and coated with caoutchouc varnish. It was covered with a net which supported the car, and was furnished with a valve, a barometer, and sand-ballast, and was, in fact, a complete aerial machine. It may be said that the art of aërostation at once attained perfection in Charles's B., and no essential change or improvement has taken place since. In consequence of the danger attending the use of fire-balloons, and the engrossing attention which they demand of the aëronaut, they have now entirely given way to the hydrogen or coal-gas balloons. Before they became obsolete, several remarkable voyages were made in them. The same Pilâtre des Rosiers made 30 leagues in one of them, the longest voyage ever executed in a Montgolfière. Among the names of the first professional aëronauts, those of

BALLOON.

Lunardi, Blanchard, and Garnerin deserve special note. Lunardi was the first who made the ascent in Great Britain; and Blanchard, with Dr. Jeffries, an American, crossed the English Channel from Dover to Calais, in circumstances of great danger, 1785, Jan. 7. Garnerin first descended from a B. by a Parachute (q.v.), 1797, Oct. 22. It is much to be regretted that the first *aéronaut*, Pilâtre des Rosiers, fell a victim to a blind devotion to his art. In order to outvie Blanchard he constructed a compound machine, consisting of a hydrogen B. above and a Montgolfière below, and started from Boulogne, accompanied by a young natural philosopher named Romain, on the morning of 1785, June 5. He had not ascended many minutes, when, as it afterwards appeared, on attempting to open the valve of the hydrogen B. by the rope attached to it, he caused a rent of several yards in it, so that it emptied itself almost immediately, and fell on the Montgolfière beneath. The fire in the latter not being kindled, the whole machine fell with frightful rapidity to the earth, and the ill-fated *aéronauts* perished on the spot whence they had risen. It is worthy of remark, that though several melancholy incidents of this kind are on record, the number of casualties in the navigation of the air has been less in proportion than in the navigation of the sea. For 1,500 *aéronauts* and 10,000 ascents, calculating approximately, only 15 lives have been lost, certainly a small proportion considering dangers and inexperience.

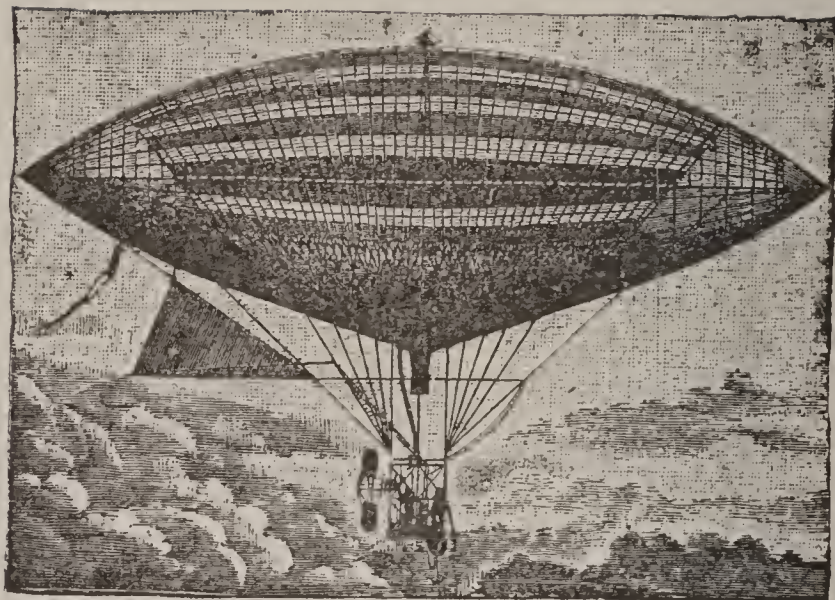
In 1794, during the wars of the Revolution, an *aërostatic* institution was formed at Meudon, near Paris, for training a corps of '*aërostiers*,' in order to observe the enemy by means of balloons. A balloon under the management of this corps was present at the battle of Fleurus, near Charleroi, fought against the Austrians. During the siege of Paris, 1870, ¹, the B. was extensively employed. Countless letters and several persons left the beleaguered city in balloons. There was, of course, no attempt made to come back in such a conveyance : carrier-pigeons were the return messengers.

Several great B. voyages have been made in the United States. The *aéronaut* Wise more than once exploded his B. when at a high elevation, to prove the correctness of his judgment, that the tatters of the air-bag, with the network, act in such cases as a parachute, moderating the rapidity of descent, and saving the *aéronaut* from violent collision with the surface of the earth. Accompanied by La Mountain and two or three other persons, Wise 'sailed' from St. Louis, 1859, July 1, expecting to be borne by the air currents eastward to the Atlantic; after a voyage of 20 hours the party landed near Watertown, Jefferson co., N. Y.—a distance of 826 m. in an air line. Mallet, 1892, voyaged from Paris to Wallen (in Hesse); the trip lasted 36 h. 30 min. Never before had a B. remained so long in the air.

A B. ascent in the interest of scientific research was made for the first time 1803, July 18, at Hamburg, by Robertson and Lhoest, the main object being to observe the

PLATE 7.

Balloon
Balsam



Tissandier's Controllable Balloon.



Balsam of Copaiba.—Plant, flower, and fruit.



Flower of the Garden Balsam.

BALLOON.

physiological effects of the highly rarefied air of great altitudes. The following year Gay-Lussac made an ascent of 23,000 ft. Other investigators in this field were Humboldt, Rush and Green, and Barral and Bixis. The most memorable ascents in the latter half of the 19th c. were made by Glaisher, who, 1862, Sep. 5, attained the greatest height yet recorded, 7 m. Between 1862-66, Glaisher, many of whose aërial voyages were made at the instance and at the expense of the Brit. Assoc. for Advancement of Science, made 28 B. ascents. Among French scientific explorers of the upper regions of the atmosphere are to be numbered Giffard, Dupuy de Lôme, the astronomer Flammarion, Gaston Tissandier, and Mallet. In Glaisher's 7-mile ascent, when his B. had reached the height of 29,000 ft. he became insensible and so continued for 7 minutes. At the greatest elevation the thermometer stood at -12° F., and the barometer at 7 in., a difference of 22 in. as compared with the reading at the earth's surface. The time of vibration of a horizontal magnet is found to be longer at high elevations than on the earth. In nearly every ascent currents of air in different directions are passed through; sometimes the changed direction is observable at the height of only 500 ft., sometimes not under 20,000 ft. Often there would be a succession of opposite currents at different heights. Glaisher found that his pulsations, 76 at starting, rose to 110 at elevations greater than 20,000 ft. A voyager in a B. is unconscious of its motion.

Gaston Tissandier made ascents in a 'controllable B.' at Paris 1883; it is 'cigar-shaped,' and floats in air with its ends in a horizontal plane. It is 91 ft. long, 28 ft. diameter through the middle, and is of thin cloth varnished. There are two horizontal shafts, one on each side, fastened with silk belts along the centre: these are made of walnut laths, and are flexible. The car is suspended from the netting. A screw propeller is driven by electricity furnished by a bichromate of potassium battery and a dynamo-electric motor. On one voyage Tissandier was able to keep head on a wind moving 10 ft. per second; when moving with the current he could easily deviate from the line of the wind. A controllable B. has been constructed for the French army service. A B. service corps is now an adjunct of all great military establishments. The French fleet in the Mediterranean has a small balloon capable of supporting the weight of a single lookout at the height of a quarter of a mile. A 'B. division' is attached to each German army-corps, comprising two transportable gas generators, a vehicle with windlass and cable for regulating the height of the B., and necessary transport wagons. The British army has had an airship division since 1879; three balloons accompanied the troops sent to the Soudan 1885. See FLYING. Also consult Hatton Turnor, *Astra Castra—Experiments and Adventures in the Atmosphere* (1865); Tissandier, *Ballons Dirigables* (1872); *Reports of aëronautical societies of Great Britain, France, Germany, etc.* See AËRIAL NAVIGATION.

BALLOT.

BALLOT, n. *băl' lôt* [F. *ballotter*, to choose lots; *ballotte*, a little ball—from *balle*, a ball]: a little ball or written ticket used in secret voting; the system of secret voting by placing little balls or written papers privately in a box: **V.** to choose or vote by ballot, now generally applied to secret voting. **BAL' LOTING**, imp. **BALLOTTED**, pp. *băl' lôt-ĕd*. **BAL' LOTER**, n. one who votes by ballot, or conducts balloting operations. Votes may be taken by B. in various ways—e.g., the voter may deposit a ball in either of two boxes, so conjoined that no one shall be able to say into which he drops it; or he may be presented with two balls—a white and a black—and so drop one of them into a box that it shall be unknown which he used. Tickets marked 'Yes,' 'No,' or with the names of candidates, will clearly serve the purpose of balls in private voting. The Dikasts in Greece voted secretly by means of balls, stones, or shells, with marks. From this use of marked shells (Gr. *ostrakon*) in popular voting came the Greek *ostracism*, or secret vote of the people, by which they drove into exile those who became obnoxious to them. Tabulæ or tickets were chiefly used by the Romans. If the vote concerned a change in the law, the tickets were marked V.R., the initial letters of the words 'Uti Rogas,' expressing consent to the proposer's proposition; and A. for 'Antiquo,' expressing adherence to the old law. If the vote concerned the election of candidates to a public office, then the tickets bore the names of the candidates. The system of secret voting in Rome was fixed by various laws, of which the Gabiniana Lex most closely resembles the modern project of vote by ballot.

The propriety of employing the B. in private clubs has never been questioned, for to the harmony of these it is essential that the votes of a few should suffice to exclude an obnoxious person; and looking to the personal and invidious nature of the vote, it is equally essential to their harmony that the voting should be secret. A candidate for admission, who succeeds in the face of a few, though not a sufficient number of voters, could not but regard those who voted against him as enemies. But if the voting be by B., all he can know, if the voters keep their own counsel, is that a few persons are unfriendly. It is thus left open for him to associate on friendly terms with all the members—a condition of the success and continuance of such associations. But whether the system was suited to political and municipal voting used to be in Great Britain the subject of keen debate, at a time when it was in use in France, in several of the United States, and in the Australian colonies.

We have said that the system prevailed in Greece, and on its fruit there—especially in the exercise of the ostracism—there have been various opinions. While some have considered that the Athenians, for instance, acted under cover of secrecy, frequently without a just sense of responsibility, there is the authority of Mr. Grote, in his *History of Greece*, on the other side, to the effect that they exercised the right most beneficially. But as we have in Mr. Grote an advocate of the B., in Gibbon we have an opponent of it. In his *Decline and Fall of the Roman Empire*, that philosopher

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dates the decline of the republic from the introduction of secret voting, which, he says, destroyed public confidence—in effect, broke up the ancient relations of patron and client, and caused a general demoralization of the people. To come to modern times, we find the B. in use in the Venetian senate; and that in Britain it was demanded first, not for the purpose of elections, but of votes in parliament. In Scotland, during the revulsions against the court in the reign of Charles II., the system was actually adopted in the legislature; but it does not appear to have afforded voters in all cases the desired protection. No one would now dream of demanding its introduction in parliament, whose proceedings, according to popular opinion, cannot be too open. On this point it may be mentioned that secret voting was the rule, for over five years (1840–45), in the chamber of deputies in France, when it was abolished, as being productive of abuse. This, however, bears on a use of the system that has now no advocates. In Victoria and New South Wales, the B. is said to have worked well, though it has been doubted whether its efficacy has been properly tested in those countries, in which there is so much individual independence, peculiar to new countries, that those who vote care little for concealment. In the United States, the general opinion is that the system is decidedly the best now practicable, though its incidental defects are clearly recognized. There are some indeed who sharply complain of its operation, claiming that it has opposed no effectual obstacle to coercion and intimidation from the majority, while those to whom the arrangements for secrecy are intrusted flagrantly betray their trust, and the voters on either side are, as a rule, well known to the public. But the opposition to the system of the B. has no popular strength.

The introduction of the B. into elections in Britain was discussed with great vigor for many years.

An element in the controversy was the question—whether the franchise was to be regarded as a public trust, or a private power to be used at the individual's discretion. The opponents of the B. maintained the franchise to be a trust, in which view it should be openly exercised. Its advocates, on the other view, held the object of the franchise to be the ascertainment of the conscientious opinions of the people. The fact is, the right of voting partakes of both characters: it is a power of expressing opinion by the agent under a sense of responsibility. The B. gives greater security for independence of thought; but the public vote is attended by the greater security for sense of responsibility. It used to be common to sprinkle pleas against the B. with high praise of the whole scheme of British politics, as open, manly, and candid, and with expressions of contempt for the B., as sneaking, and dissonant with that scheme. But the advocates of the B. were not unprepared with a ready and obvious retort to such arguments. Public feeling was kept alive on this question by annual motions in parliament. From 1835, its introduction was an open question with the whigs. The controversy was ended,

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1872, July, when voting at parliamentary and municipal elections in Great Britain and Ireland was decreed to be by ballot.

BALLOT, AUSTRALIAN SYSTEM OF: plan first adopted in Australia to secure the secrecy of the ballot and to prevent the intimidation or corrupting of the voter. It provides, in brief, that all ballots shall be furnished at public expense, and that none but these official ballots shall be used. The names of all candidates regularly nominated for public offices are to be printed on the ballots. The ballots are to be distributed only by sworn ballot clerks, at the polls, to legal voters, and for actual and immediate use in voting. When the voter receives a ballot he is allowed 5 minutes in which to retire into a booth (alone) conveniently arranged, and indicate on the ballot his choice for the offices to be filled. This he may do by crossing off all names but his choice, by indicating his choice with a $\times$ opposite the name, or by crossing off all names and inserting a new one. He then proceeds directly to the ballot-box, and without allowing the face of his ballot to be seen by any one, or speaking to any one concerning it, deposits it as his vote. Should the voter spoil a ballot in preparing it, he may successively obtain others, one at a time, not exceeding three in all, on returning each spoiled one to the ballot clerks, who must immediately cancel and preserve all spoiled ballots. Should the voter be blind or illiterate, he may apply to one of the ballot clerks for assistance in preparing his ballot, and such clerk must take an oath of secrecy and fidelity before such preparation. No person is allowed to peddle or offer any ballot to another person within 100 ft. of any polling-place on the day of election. The advantages claimed for this system by its advocates are that its secrecy interposes an effectual prevention of bribery; that the secret ballot secures the voter against the coercion or undue solicitation of others, and enables an elector to vote as he pleases; that money will be less of a factor in politics in consequence of the abolition of an excuse for assessments of candidates; and that elections will more truly show the registering of the popular will.

For many years there has been in the United States a determined agitation for ballot reform and purity at the polls. Of the many plans suggested, none have seemed to answer the requirements so completely as the above system; and already its chief features, modified for local considerations, have become the ballot law of several states. Mass. was the first to reform her ballot laws in harmony with the Australian plan 1888. The same year the legislature of Ky. adopted a substantially similar plan for the city of Louisville. In 1889 Ind., Mont., R. I., Wis., Tenn., Minn., Mo., Mich., and Conn. adopted reform systems in the above order, all excepting Conn., following the Mass. bill in the main.

The Mass. plan provides, in brief, that any person desiring to vote shall give his name, and, if requested so to do, his residence, to one of the ballot clerks, who shall there-

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upon announce the same in a loud and distinct tone of voice, clear and audible, and if such name is found upon the check-list by the ballot officer having charge thereof, he shall likewise repeat the said name, and the voter shall be allowed to enter the space inclosed by the guard-rail as above provided. The ballot clerk shall give him one, and only one, ballot, and his name shall be immediately checked on said list. Besides the election officers, not more than four voters in excess of the number of voting shelves or compartments provided shall be allowed in said inclosed space at one time. Then follow the directions in the Australian system for indicating the voters' choice of candidate, procuring fresh ballots for spoiled ones, and depositing the ballot. No such voter shall be allowed to occupy a voting shelf or compartment already occupied by another, nor to remain within said inclosed space more than ten minutes, nor to occupy a voting shelf or compartment for more than five minutes in case all of such shelves or compartments are in use, and other voters are waiting to occupy the same. No voter not an election officer, whose name has been checked on the list of the ballot officers, shall be allowed to re-enter said inclosed space during said election, neither shall any person take or remove any ballot from the polling-place before the close of the polls.

In N. Y. and N. J., ballot-reform laws were enacted 1890, May. The law of N. Y. provides that all ballots shall be printed and distributed at public expense; that there shall be as many different kinds of ballots as there are different political parties represented in duly certified nominations; that each co. clerk shall use the same size, quality, and tint of paper, kind of type, and quality and tint of plain black ink, for all ballots used at one election. A sufficient number of voting booths or compartments, provided with shelves, pens, pencils, ink, blotting-paper, and mucilage, shall be provided at each polling-place, with a guard-rail so placed that only such persons as are inside said rail can approach within six ft. of the ballot-boxes and of such voting booths or compartments. On receiving from the clerk one of each kind of ballots furnished for the particular polling-place, the voter shall take them to the booth or compartment, and there in secret prepare his ballot. When a voter is 'physically' unable to prepare his ballot without assistance, he will be permitted to take a person of his own selection into the booth with him. If any voter spoils a ballot, he may obtain another full set, and so on successively, not exceeding four full sets in all, on returning the set containing the spoiled ballots. The voter then folds the ballot which he intends voting so that no one can see which one it is, and before voting delivers to an inspector all remaining ballots.

In 1892, Jan., all the states and territories had enacted laws prescribing a mode of balloting based on the Australian system, except Io., Kan., Va., N. C., S. C., Ga., Fla., Ala., Miss., La., and N. Mex. and Utah.—See **SUFFRAGE**.

BALLOTA—BALLS.

BALLOTA, n. *bāl-lō'ta* [Gr. *ballote*—from *ballō*, I throw, I throw away, I reject, in allusion to its unpleasant smell]: genus of hairy or woolly plants of the ord. *Lamiaceæ* or *Labiates*. The plant is 2 or 3 ft. high, with whorls of purple or white flowers. *B. nigra* is Horehound (q.v.).

BALLOTTEMENT, n. *bāl-lōt'měnt* [Fr.—from *balloter*, to toss]: tossing; method of testing pregnancy from the 5th to the 8th month, by inserting the finger with an impulse against the uterus, and noting the sensation in the finger when the fœtus thus tossed up sinks again upon it.

BALLOTIDÆ, n. plu. *bāl-lōt'î-dē* [see **BALLOTA**]: family of labiate plants, ranked under the tribe *Stacheæ*.

BALLOU, *bāl-lō'*, HOSEA: 1771, Apr. 30—1852, June 7; b. Richmond, N. H. On account of the poverty of his father, an unpaid Bapt. preacher, he was not able to attend school till he was 20 years of age. He adopted Universalist views and was expelled from the Bapt. Church; became a school-teacher and began to preach; was settled at Dana, Mass., 1794–1802; preached five years at Barnard, Vt., and neighboring towns; was pastor at Portsmouth, N. H., eight years; at Salem, Mass., two years; and 1817–52 was pastor of the 2d Universalist Church, Boston, where he founded the *Universalist Magazine*, and became the recognized leader of the denomination. He wrote a large number of hymns, and several theological works, of which the most important was an *Examination of the Doctrine of Future Retribution*—His grand-nephew, HOSEA B., S.T.D. (1796–1861), b. Halifax, Vt., was a noted Universalist preacher, was one of the founders of Tufts College, and from 1853 till his death its president.

BALLOU', MATURIN MURRAY: editor: b. Boston, 1820, Apr. 14; son of Hosea B. (1st). He studied for college in the Boston High School, but did not enter. He was for five years a clerk in the Boston post-office; afterward for five years a clerk in the U. S. treasury dept. His literary start was made in the *Olive Branch*, and he afterward edited and owned *Gleason's Pictorial* and *Ballou's Monthly*. He has travelled over nearly the entire world, even undertaking 1886 a voyage to the Arctic regions. Meanwhile he has been an active writer and journalist, his ventures, besides those already mentioned, having been *Ballou's Pictorial*, *The Flag of Our Union*, and the *Boston Sunday Budget*. He was one of the original proprietors, and for many years chief editor, of the *Boston Daily Globe*. His writings include: *Due West*; *Due South*; *The History of Cuba* (1854); *Biography of the Rev. Hosea Ballou*; *Life Story of Hosea Ballou*; *Principles of Thought*; *Notable Thoughts about Women*; *Edge Tools of Speech* (1886); *Footprints of Travel* and *The New Eldorado* (1889); and *Aztec Land* (1890). Died 1895.

BALLS, HOLLOW, in Military Pyrotechny: used—by being thrown or cast and broken—to give light, to produce dense smoke, or to diffuse suffocating odor. Some of them, though called B., are not globular in shape. *Light-B.* con-

BALL'S BLUFF—BALLYMENA.

sist of canvas stretched over a skeleton-frame, and painted; the frame is filled with a composition of saltpetre, sulphur, resin, and linseed oil, rammed down; and is provided with a fuse, the length of which determines the time that will elapse before the composition ignites. These light B. weigh from 5 lbs. to 70 lbs. each, according to size. They are intended to give out a brilliant light, which may reveal the operations of the enemy during night at a siege or in the field. *Smoke-B.* are made of several thicknesses of paper, shaped by means of a globular core or mold. They are filled with gunpowder, saltpetre, powdered sea-coal, Swedish pitch, and tallow; and are calculated, after being fired off, to send out a dense smoke for nearly half an hour, in order to blind or incommode the enemy. *Stink-B.* are filled with a composition which, when ignited, diffuses an odor almost intolerable. Most of these projectiles, especially light-B. and smoke-B., are fired from mortars, rather than from guns. For extensions of the principle of these inflammable balls, see ASPHYXIANTS.

BALL'S BLUFF: Loudon co., Va; on the s. bank of the Potomac river; 32 m. n.w. of Washington: scene of a defeat of the Union troops by a Confederate force 1861, Oct. 21. Col. Devens was directed by Gen. Stone to make a demonstration against the enemy on the opposite side of the river. He proceeded with a Mass. regt. to the bluff, and advanced toward Leesburg, but was driven back by a Confederate force under Gen. Evans. Col. Baker, a senior officer, arrived with a Cal. regt. and took command of the united force, numbering about 1,900. The Confederate force, of about 1,700, had a protected position and kept up a terrible fire. Col. Baker was killed; his troops retreated in confusion, but were intercepted by a Miss. regt. and utterly routed. The Union loss was more than 300 killed and 700 wounded and prisoners; the Confederate, reported 155.

BALLY, *băl'lı*, or **BAL**: a Celtic word or prefix, signifying 'town' or 'dwelling'; entering into the composition of hundreds of names of places in Ireland and Scotland. It is allied (see letter B) to Gr. *polis*, city, and to the Lat., Ital., and Span. *villa*.

BALLYCASTLE, *băl-łi-kăs'l*: small seaport town in the n. of Antrim county, Ireland; in an open bay opposite Rathlin Isle; 88 m. n. of Belfast, 5 m. s.w. of Fairhead. It lies at the base of Knocklayd Mountain, 1,635 ft. high; and the marine and mountain scenery around is very romantic. B. consists of an upper and lower town, a quarter of a mile apart. Its harbor and pier cost £150,000, but the former is now filled with sand. Coal was dug here at least 500 years ago. Linen manufacture and salmon-fishery are carried on here. Near B. are the Bonnamargy Abbey ruins. There is a singular fissure, called the 'Gray Man's Path,' in the face of a greenstone precipice near B. on the way to Fairhead. Pop. about 2,000.

BALLYMENA, *băl-łi-mě'na*: small inland town in the

BALLYSHANNON—BALM.

centre of Antrim county, Ireland; in a plain, on the right bank of the Braid; 2 m. above its junction with the Maine, 33 m. n.n.w. of Belfast. It is in a densely peopled and well-cultivated district, the inhabitants busied in agriculture and in the manufacture of linen. B. is one of the greatest linen and flax markets in Ireland, and its vicinity is covered with extensive bleach-fields. Pop. (1881) 8,883.

BALLYSHANNON, *băl-lĭ-shăn'non*: small seaport town in the s. of Donegal county, Ireland; the chief town of the county, though not the capital. It is at the mouth of the river Erne, on a small inlet of Donegal Bay, 120 m. n.w. of Dublin. A bridge of 14 arches crosses the Erne here. The Erne discharges more water than any other Irish river, except the Shannon, and falls 140 ft. over a rugged bed in the last 9 m. of its course; 400 yards below the bridge at B. the river falls in a cataract 16 ft. high at low water, and 450 ft. wide, over a limestone ledge of rock. The chief streets of B. are very steep. There is a valuable salmon-fishery on the river. The export trade is small, by reason of a bar at the mouth of the harbor, and the prevalence of west winds. Pop. (1891) 2,958.

BALM, n. *bâm* [F. *baume*; OF. *bausme*—from Gr. *bal'sâmon*; L. *bal'sâmum*, balsam]: a fragrant plant—the common balm is *Melis'sa officinâlis*, ord. *Labiâtæ*; a valuable ointment that soothes and heals; that which soothes, mitigates, or heals: V. to anoint with balm; to soothe. **BALM'**-ING, imp. **BALMED**, pp. *bâmd*. **BALMY**, a. *bâm'ĭ*, like balm; mild; soothing. **BALM'ILY**, ad. *-ĭ-lĭ*. **BALM'INESS**, n. **BALM-BREATHING**, a. breathing balm, or producing a highly agreeable effect upon the senses or heart. **BALM - DEW**, n. odoriferous dews, or dews fitted to soothe. **BALMIFY**, v. *bâm'ĭ-fĭ*, to make balmy.



Balm (*Melissa officinalis*).
 Balm (*Melissa officinalis*). an agreeable and somewhat exhilarating beverage called balm wine. B. was formerly in

BALM, *bâm* (*Melissa officinalis*): an erect, branching, perennial, herbaceous plant, nat. ord. *Labiâtæ*; native of the s. of Europe. It has ovate crenate leaves, and axillary half-whorls of white flowers on one side of the stem. The whole plant has an agreeable lemon-like smell, on account of which it is frequently cultivated in gardens. The stem and leaves are used in medicine as a gentle aromatic, stimulant, and tonic. B. is employed also for making an agreeable and somewhat exhilarating beverage called balm wine. B. was formerly in

BALM OF GILEAD—BALNAVES.

much higher repute than now for its medicinal virtues. Its qualities depend on an essential oil of a pale yellow color, called Oil of Balm.

For medical use, the herb should be cut before the appearance of the flowers, which begin to expand in July. It is nearly inodorous when dried. The taste is somewhat austere, and slightly aromatic. B. produces scarcely any remedial operation upon the system. The quantity of oil which it contains is not more than sufficient to give a pleasant flavor to the infusion, which forms an excellent drink in febrile complaints, and, when taken warm, tends to promote the operation of diaphoretic medicines.—A variety of the common Cat-mint (*Nepeta cataria*), with a smell like that of B., is often mistaken for it.—MOLDAVIAN B. (*Dracopis Moldavicum*) is a native of the country from which it derives its name, and of Siberia, etc.; an annual plant, having, when fresh, a smell like that of B., but less pleasant. It is much used in Germany for flavoring dishes.—BASTARD B. (*Melittis Melissophyllum*), native of the s. of England and of many parts of Europe, is a very beautiful plant, which when dried has a delightful fragrance, and retains it long. All these are of the nat. ord. *Labiatae*.

BALM OF GIL'EAD: see BALSAM OF GILEAD.

BALMORAL CASTLE, *bâl-mor'âl*: the autumnal residence of Queen Victoria; in a beautiful dell in Braemar (the s.w. dist. of Aberdeenshire), on a natural platform that slopes gently down from the base of Craigan-gowan to the margin of the river Dee in front; about 48 m. west of the city of Aberdeen. The castle commands a magnificent prospect on all sides. In 1848, Prince Albert purchased the reversion of a 38 years' lease from the representatives of Sir Robert Gordon, who had held it under the Earl of Fife; and in 1852 he acquired the fee-simple of the estate from the Fife trustees for a sum of £32,000. The old castle not being sufficiently commodious for the royal family, Prince Albert erected a new one at his own expense, in what is called the Scottish baronial style of architecture. The castle consists of two separate blocks of building, united by wings and a massive tower 35 ft. square, rising to the height of 80 ft., surmounted by a turret 20 ft. high. At a distance, the castle, built of granite, has a strong and imposing appearance, looking almost as if it had been hewn out of one huge rock of that material. Great improvements have been made, chiefly those projected by the late Prince Albert in the approaches to the royal residence. The estate now includes Birkhall, Knock Castle ruins, Loch Muick, and 'dark Lochnagar,' celebrated by Byron (about 7 m. s.w. of B. C.), and contains about 10,000 acres, in addition to 30,000 acres of hill-ground, which have been converted into a deer-forest.

BALNAVES, *bâl-nav'ës*, HENRY, of Halhill: eminent lay-reformer of the 16th c.; b. Kirkcaldy, Fifeshire; d. 1579 or 1580. His parents were poor, but gave him a univ. education at St. Andrews, after which he studied in a free school at Cologne, where also he received in-

BALOTRA—BALSAM.

struction in the principles of Luther and the reformation. On his return to Scotland, he studied law, and when Arran was appointed to the regency, B. was made sec. of state. In 1543, he was imprisoned on account of his Protestantism. When liberated he appears to have been active on the Protestant side; and it is asserted that he was privy to the conspiracy for the murder of Cardinal Beaton. Later he was captured by the French, and with Knox and others sent to Rouen as prisoners of war. In prison B. wrote a treatise on Justification (to which Knox added marginal notes), afterwards published with the title of *The Confession of Faith*. When Mary of Guise was raised to the regency, 1554, B. returned to Scotland and was one of the commissioners who settled the treaty of Berwick, 1559-60, which established by law the reformed religion in Scotland. In 1563, B. was nominated a commissioner to revise *The Book of Discipline*.

BALOTRA, *bāl-ō'trā*: town of India, in the Rajpoot state of Joudpore, 59 m. s.w. of the city of Joudpore; on the right bank of the river Loonee. Being on the high-road from Joudpore to Dwarka, a celebrated place of pilgrimage in the west of Guzerat, it is a great resort of pilgrims, with whom its bazaar is often crowded. Many of the inhabitants of the town subsist by providing for their wants. The town is supplied with good water from 125 wells, lined with masonry. Pop. 7,275.

BALSA, n. *bāl'sa*, or BALZA, *bāl'za* [Sp. and Port. *balsa*]: a raft or fishing boat, used chiefly on the Pacific coast of S. America.

BALSAM, n. *bawl'sam* [Gr. *bal'sāmon*; L. *bal'sānum*, balsam (see BALM)]: a soothing ointment of an oily nature; a semi fluid resin. BALSAMIC, a. *bāl-sām'ik*, or BALSAM'ICAL, a. *-ī-kāl*, like balsam; soft; unctuous; mitigating. BALSAM'ICALLY, ad. *-lī*. BAL'SAMIF'EROUS, a. *-īf'ēr-ūs* [L. *fero*, I produce]. BALM OF GILEAD, or BALSAM OF MECCA, common names for the resinous juice of the balsam-tree of Syria, reckoned very precious; the juice of the *Balsām-ōdēn'dron Gilēādēn'sē*, ord. *Burseracēæ*. BALSAM OF SULPHUR, an ointment considered useful for foul ulcers, prepared by dissolving 1 part of flowers of sulphur in 8 parts of olive-oil (oil of turpentine sometimes used). BALSAM OF SATURN, an ointment prepared from sugar of lead and oil of turpentine, etc. BALSAM-WEED, *Graphalium polycephalum*, a plant used in the manufacture of paper. BALSAM'ICS, n. plu. *-iks*, in *med.*, applied to several preparations for external use. BALSAMA'TION, n. *-ā'shūn*, the act. or operation of impregnating with balsam.

BAL'SAM: name applied to resinous, oily substances used medicinally, mostly ointments; though the term B. without addition, now denotes usually the balsams of Peru and Tolu. These two balsams are similar in their important properties, and both are produced by trees of the genus *Myrospermum* (or *Myroxylon*), of the nat. ord. *Leguminosæ*, sub-ord. *Papilionacēæ*, natives of the tropical parts of America. *M. pereiræ*, which is called also the Quinquino,

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a beautiful tree, common from Peru to Mexico, is generally regarded as the species which produces the B. of Peru; and *M. toluiferum*, a very similar species, found on the mountains of Tolu, the banks of the Magdalena, etc., as that which produces the B. of Tolu; but the difference is due, perhaps, to the modes of procuring and preserving the B.; and other species of the same genus (*M. punctatum* and *M. pubescens*) also are supposed to yield it. B. of Peru appears in two forms, known as *White B. of Peru* and *Black B. of Peru*; the former of which has been said to be obtained from the pods, and the latter from incisions in the trunk of the tree; though it has been stated that the white B. flows from the trunk, and that the black B. is obtained by distilling down the wood after the manner of tar-burning, or by boiling with water. White B. of Peru is at first of the consistence of recent honey, and of a light yellow color; the Black B. is of a reddish or blackish brown color, and of the consistence of treacle. B. of Tolu, until recently, appeared in commerce dry and friable, but is now usually soft and tenacious when first imported, becoming hard by age. Both balsams have a very fragrant odor. They are used in confectionery, to impart a flavor like that of vanilla; also in perfumery, and for pastilles, etc. In medicine, they are administered as gentle stimulants and tonics, and particularly in chronic bronchial affections. *Tolu lozenges* are a popular and pleasant remedy for troublesome coughs. These balsams are also used for cleansing ulcers.—They contain Cinnamic Acid, and a peculiar oily substance, called *Cinnameine*, also known as Oil of B. of Peru. The name *White B. of Peru* is sometimes given to a balsamic substance which flows from the *Liquidambar styraciflua*. See LIQUID-AMBAR.

BAL'SAM, or BALM OF GILEAD: liquid resinous substance, which has long had high reputation in the East, prized not only for its fragrance, but also for medicinal virtues. It is the subject of several allusions in the Old Test., which show the prevalent opinion of its preciousness; and it is celebrated by Strabo, Pliny, Diodorus Siculus, and other ancient writers, as a cure for almost every disease. It is still doubtful what tree furnishes it, but it is generally believed to be a species of *Balsamodendron* (q.v.)—a small tree growing in Arabia and Abyssinia, and known as *B. Gileadense*. The finest balsam, called Opobalsam or Balm of Mecca, is obtained by incisions, is at first turbid and white, but finally becomes of a golden yellow color, and of a consistence like honey. Inferior kinds are obtained by boiling the fruit and the wood. B. of Gilead is irritating when applied to the skin, and is believed to resemble B. of Copaiva in its effects upon the human system. *Balsamodendron Opobalsamum*, a species very nearly allied to *B. Gileadense*, is sometimes said to furnish this balsam.

Other substances, sometimes designated balsams, and possessing similar fragrance, are produced by different species of *Amyridaceæ* (q.v.). Among them is one called American Balm of Gilead, the produce of a tree called *Icica Carana*, not the 'Balm of Gilead' poplar; also a

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number of species of *Clusiaceæ*—Balsam of Umiri, a fragrant yellow fluid, by *Humirium floribundum*, a South American tree of the nat. ord. *Humiriaceæ*.—CANADIAN BALSAM is a kind of turpentine obtained from the Balm of Gilead Fir (*Abies Balsamea*); HUNGARIAN BALSAM, from the Mugho or Mountain Pine (*Pinus Pumilio* or *Mughus*); and CARPATHIAN BALSAM, from the Stone Pine (*Pinus pinea*). See FIR and PINE.—BALSAM OF COPAIVA is the produce of different species of *Copaifera*. See COPAIVA.

BAL'SAM: common name of a sub-order of succulent herbaceous plants, *Balsamineæ*, order *Geraniaceæ*, of botanists, of which the beautiful B. (*Impatiens balsamina*



Balsam (*Impatiens Noli-me-tangere*).
a, top of stem with leaves and flowers; *b*, ripe fruit unopened; *c*, ripe fruit, elastically opening.

or *Balsamina hortensis*), much cultivated in gardens and green-houses, is a familiar example. Upwards of one hundred species are known, natives chiefly of damp bushy places in the East Indies, and many of them plants of great beauty. Almost all are annuals, and have generally white or red flowers. This nat. ord. is very closely allied to *Geraniaceæ* (see GERANIUM) and *Oxalideæ* (q.v.), wood-sorrel, etc., but is distinguished from both by the extreme irregularity of the flowers, and from the former also by the beakless fruit, which is a five-celled capsule, bursting by five elastic valves. The leaves are simple and without stipules, the flowers generally axillary.—The common B. is a native of the East Indies and Japan. Many fine varieties have resulted from careful cul-

BALSAMODENDRON—BALTIC SEA.

tivation. It has an upright succulent stem, usually about 1–2 feet high, but in favorable circumstances will attain a greater size. It often appears with flowers partially double, but still capable of producing seed. In Britain, the seed is usually sown on a slight hotbed, and the plant is often kept in the green-house; although even in Scotland it may be made an ornament of a sheltered border. It is one of the flowers frequently to be seen in cottage-windows. A vulnerary was formerly prepared from it, whence it has its name. One species of *B.* (*Impatiens Noli-me-tungere*), called Yellow B., or Touch-me-not, is a native of Europe, and a doubtful native of Britain. It has yellow flowers, and one of the petals prolonged into a spur. Its ripe capsules burst on the slightest touch. This and two other species are natives of North America.

BALSAMODENDRON, *băl'sa-mo-děn'dron* [Gr. balsam-tree]: genus of small trees or bushes, nat. ord. *Amyridaceæ* (q.v.), having small green axillary flowers, small dry oval fruits, and small pinnated leaves with 3 or 5 leaflets. Some of them are spiny: they generally appear scrubby and have little foliage. Balsamic substances are obtained from their wood and fruit—as Balsam of Gilead (q.v.), Myrrh (q.v.), Bdellium (q.v.), and Oriental Elemi (q.v.). The red resinous wood of *B. Katof* is a common article of sale in Egypt; and a species called Schnee is much cultivated in Afghanistan for its aromatic and stimulant properties. All the known species are natives of the East Indies, Arabia, and the east of Africa, except that which yields African bdellium, found in Senegal.

BALTA, *băl'tâ*: a well-built and thriving town, in the govt. of Podolia, Russian Poland; on the Kodema, an affluent of the Bug. Pop. over 20,000.

BALTIC, a. *bawl'tik* [old Sw. *bælt*, as two of its entrances are still called: L. *baltĕŭs*, a belt]: from the Baltic or its shores, or relating to them. *Note*.—Perhaps the name *Baltic* may be connected with the worship of *Bel* or *Baal*, the ancient sun-god. See BAAL.

BALTIC PROVINCES, *bawl'tik* (in Russia): in a wider sense, the five Russian governments bordering on the Baltic—viz., Courland, Livonia, Esthonia, Petersburg, and Finland; in a restricted sense, it often designates the first three. The Baltic provinces once belonged to Sweden, except Courland, which was a dependency of Poland. They came into the possession of Russia partly in the beginning of the 18th c., through the conquests of Peter the Great, partly under Alexander in 1809. They have still very various constitutions, though the usual 'government' machinery has been introduced, and every effort is made completely to Russianize them. The five Baltic governments in the wider sense have 191,526 sq. m., and (1897) pop. 7,015,126.

BAL'TIC SEA: the great gulf or shut sea bordered by Denmark, Germany, Russia, and Sweden, and communicating with the Kattegat and North Sea, by the Sound and the Great and Little Belts; length, from 850 to 900 m.; breadth, from 100 to 200; area, including the Gulfs of Bothnia and Finland, about 160,000 sq. m. Its depth is on

BALTIC SEA.

an average 15–20 fathoms, in many places not half so much, seldom more than 40–50, and never exceeding 167. Its shallowness and narrowness, the flat coasts of Prussia on the one side and the rocky coasts of Sweden on the other, and above all the numerous and sudden changes of wind accompanied by violent storms, make the navigation very dangerous. The group of the Aland Islands divide the s. part of the sea from the n. part or Gulf of Bothnia (q.v.). The Gulf of Finland (q.v.), branching off eastward into Russia, separates Finland from Esthonia. A third gulf is that of Riga or Livonia. The Kurisch and other Haffs (q.v.) are not gulfs, but fresh-water lakes at the mouths of rivers.

The water of the Baltic is colder and clearer than that of the ocean. It contains only a fifth of the salt of the Atlantic, and ice hinders its navigation from three to five months yearly. Tides, as in all inland seas, are little perceptible—at Copenhagen, about a foot; yet the water rises and falls at times, though from other causes, chiefly from the varying quantity of water in the rivers at different seasons. Upwards of 250 rivers flow into this sea. The chief from Germany are the Trave, Warnow, Oder, Rega, Persante, Vistula, Pregel, and Niemen; from Russia, the Windau, Düna, Narva, Neva, and Ulea; and from Sweden, Tornea, Lulea, Pitea, Umea, Angerman, Dal, the water of Lake Maeler, and that of Wetter and other lakes through the river Motala. The basin of the Baltic occupies at least 880,000 sq. m., or about one-fourth of all Europe; and only about a fourth of the boundary of the basin is mountainous. The principal islands are Zealand, Fünen, Bornholm, Samsøe, Möen, Langeland, and Laaland, belonging to Denmark; the Swedish islands Gotland, Oland, and Hveen (in the Sound); the Aland Islands, Dagö, and Oesel, belonging to Russia; and Rügen, to Prussia. The number of vessels that pass the Sound to or from the Baltic annually is very large. See SOUND DUTIES. Timber, hides, tallow, and grain, are chief exports from the countries on the Baltic. The Eider or Schleswig-Holstein canal, connecting the Baltic near Kiel with the North Sea at Tonningen, facilitates the grain trade in mild winters. The two seas are connected also by the Gotha canal, which joins the lakes of south Sweden. The most important harbors in the Baltic are: in Denmark, Copenhagen and Flensburg; in Germany, Schleswig, Kiel, Travemünde (Lubeck), Wismar, Rostock, Stralsund, Stettin, Swinemünde, Danzig, Elbing, Königsberg, Pillau, and Memel; in Russia, Riga, Revel, Narva, Kronstadt, and Sveaborg; and in Sweden, Stockholm, Karlskrona, and Ystad.—The shores of the Baltic in Prussia and Courland have been long noted for the amber cast ashore by the waves in stormy weather. Another important phenomenon connected with the Baltic is an alleged slow vertical movement of its coasts, *downwards* in the south of Sweden, but further north *upwards*, being there supposed to be at the rate of 3 ft. in a century. See Lyell's *Principles of Geology*.—The Germanic nations call this sea *Ostsee*, or Eastern Sea; the name Baltic is derived by Dr. Latham from an island Baltia, mentioned by Pliny, and which Dr. Latham considers to be Zealand,

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BALTIMORE, *bawŏl'tŭ mor* or *-mōr*: the chief city of Maryland, seat of justice of B. co.; and a port of entry; lat. $39^{\circ}17'N.$, long. $76^{\circ}37'W.$; on the n. bank of the Patapsco river, 14 m. from its entrance into Chesapeake Bay, 178 m. from the Atlantic Ocean, 40 m. n.e. from Washington, 98 m. s.w. from Philadelphia, 185 m. s.w. from New York. B. is connected by railway with Philadelphia, Washington, Annapolis, Winchester, Columbia, York, Lancaster, Harrisburg, etc. It is about $4\frac{1}{2}$ m. long from e. to w. and $3\frac{1}{2}$ broad from n. to s.; area abt. 10,000 acres. A stream, called Jones's Falls, divides it into two nearly equal parts, and supplies water power and pure water.

B. was laid out in 1730 within a very limited space, and received its name in honor of Calvert, Lord Baltimore. Various small settlements were afterwards made in the vicinity, which were gradually absorbed into B., until, in 1752, it had about two dozen houses and 200 inhabitants. In 1756, a number of Acadians, who had been expelled from the w. shore of Nova Scotia, settled in B. In 1767, the co. seat was established here, and a court house was built on the site of the present battle monument. Within a few years of the opening of the Revolution, a newspaper was published in B., there was a theatre, and a stage line connected B. with Philadelphia and New York. In 1776, the town contained over 550 houses, and nearly 6,000 inhabitants. In that year, the Continental Congress met in B. After the close of the Revolution, the city grew with rapidity, new acquisitions being in large numbers Protestants from the north of Ireland, although the colony was originally Roman Catholic. In 1796, B. was made a city, and a mayor was chosen.

In 1814, during the war with Great Britain, B. was attacked by the British forces, and a fierce battle occurred, in which the Americans were defeated. Fort McHenry, between the harbor and the Patapsco river, commanding the entrance to the port, was bombarded by the British in 1814, on which occasion the celebrated national song, 'The Star Spangled Banner,' was composed by Francis Scott Key, who was an American prisoner on board one of the English ships. B. became noted at the opening of the civil war by a mob attacking, 1861, Apr. 19, parts of the 6th Mass. and 7th Penn. regiments, which were passing through the city to the defense of Washington.

B. has a capacious harbor, including an inner basin suitable for small vessels, and an outer harbor which will accommodate the largest ships. It has an extensive corn trade, and is one of the largest flour centres in the world, besides being the chief market for tobacco in the country. It has also extensive manufactories. In the calendar year 1902 the foreign commerce was: imports \$25,261,375; exports \$74,364,226; total trade \$99,625,601. From two to three thousand vessels enter and clear the port in the foreign trade every year. Two great arteries of trade, the B. and Ohio and the Northern Central railroads, enable B. to compete successfully for the trade of the North and the Northwest. The exports from this port include corn,

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tobacco, cotton, petroleum, bacon, butter, cheese, and lard. B. is also the chief point where are worked the valuable copper ores from Lake Superior, the product amounting to about 4,000 tons of refined copper annually; the smelting works being in Canton and employing about a thousand men. There are also locomotive works, cotton factories, brass and bell foundries, rolling mills, nail factories, iron works, and numerous other manufacturing establishments.

In 1900 the various manufacturing interests reported 6,361 establishments, \$117,869,175 capital, and 79,084 hands; paid \$29,304,520 for wages, \$87,531,743 for materials, and \$8,093,119 for miscellaneous expenses; and had \$161,945,811 in value of products. The canning of food products is here an extensive and important business.

On the s. side of the inner basin is Federal Hill, a prominent eminence from which can be obtained extensive views of the city, river, and bay. The city has purchased this land for use as a park. The United States Signal Station of B. is on this hill. All the works on the n. side of the city are connected with tide water at Canton by tunnels, which are among the largest structures of the kind in the country. The B. and Potomac tunnel is, excepting the Hoosac tunnel, the longest in America (6,699 ft.), and the Union tunnel is about half that length. These engineering works, completed 1873, cost \$4,500,000. Druid Hill Park, occupying 680 acres in the suburbs of the city, and reached by street-car lines, is considered one of the most charming parks in the country, owing its beauty chiefly to its natural advantages, the surface of the land being undulating, and covered with trees, many of which are the oldest and finest in any public grounds in the United States. Patterson Park, Greenmont Cemetery, Loudon Park Cemetery and Loraine Cemetery, all are picturesquely laid out.

B. is popularly known as 'The Monumental City,' because of the number and beauty of its public monuments. Principal among these is the Washington Monument, in the heart of the city, at the intersection of Mount Vernon Place and Washington Place. This monument stands on ground 100 ft. above tide water; its total height above the river is 312½ ft. On its base, 50 ft. square and 20 ft. high, stands a Doric shaft 176½ ft. high, which supports a colossal statue of Washington 16 ft. in height. The whole is built of brick cased in white marble, and cost \$200,000. In Monument Square, at the junction of Fayette and Calvert streets, stands the Battle Monument, erected, 1815, in commemoration of the defenders of the city who fell in the previous year, in battle against the British. There are also the Wilkey Monument, the Wells and McComas Monument, the Poe tombstone in the churchyard of the Westminster Pres. Church, and others.

The public buildings of B. are among the finest in the country. The City Hall, completed 1875, occupying an entire square, cost more than \$2,250,000. It is of marble in the Renaissance style, four stories high with French roof, and an iron dome 260 ft. in height. Its other dimensions are 225 x 140 ft. The U. S. Court-house is a fine granite

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structure. The old 'Exchange' has a façade 240 ft., and colonnades of Ionic columns on two sides, with an immense dome. This building contains the U. S. Custom-house and the Merchants' Bank. The new post-office is on the square bounded by Fayette, Calvert, Lexington, and North streets. Other fine buildings are the new Stock Exchange, the Corn and Flour Exchange, the Rialto Building, the Masonic Temple, built of stone in 1870 at a cost of \$400,000. and the Y. M. C. A. building

B. contains about 200 churches. The most important is the Cathedral, corner of Mulberry and Cathedral streets. This building is of granite, in the form of a cross, and is 190 ft. long, 177 broad, and 127 high. Two tall towers rise from the roof at the w. end. It contains one of the largest organs in the country; also two interesting paintings, gifts of Louis XVI. and Charles X. of France. Other churches of striking beauty, or possessing other elements of interest, are the Mount Vernon church (Meth. Epis.), which fronts the monument, built of granite serpentine, and faced with Ohio and Connecticut sandstone, with eighteen Aberdeen granite polished columns, and near this, the First Pres. Church, said to be the finest specimen of Lancet-Gothic architecture in America. It has a spire 268 ft. high, and side towers 78 and 128 ft. high respectively. The neighborhood of these two churches is the aristocratic residence quarter, and contains the finest private dwellings in the city. Other important churches are St. Alphonso, St. Vincent de Paul and St. Ignatius Loyola (Rom. Cath.), Grace Church, Emanuel Church, Christ Church, St. Paul's, St. Peter's, and St. Luke's (Epis.), the Unitarian Church, the Eutaw Public Church, the Brown Memorial Church (Pres.), the First Meth. Epis. Church, and the Hebrew Synagogue in Lloyd street.

Among the public institutions of B., one of the principal is the Peabody Institute, founded and endowed by George Peabody, the London banker. This institution contains a free library of 75,000 vols., a lecture hall and a conservatory of music, with a department of art in preparation. The Athenæum, corner of St. Paul and Saratoga streets, built in the Italian style, contains the B. Library and the collections of the Maryland Historical Soc., in all 25,000 vols. The Maryland Library (26,000 vols.) occupies a new building, corner of Charles and Saratoga streets. The Maryland Institute, the first floor of which is a market, contains a considerable library, lecture rooms, etc. The Johns Hopkins Univ., which has an endowment of more than \$3,000,000 left by Johns Hopkins, a wealthy Baltimorean, who died 1873, is at Howard Street and Druid Hill Avenue; but a new location and additional endowment were secured 1902. The Johns Hopkins Hospital whose endowment by the same bequest is over \$2,000,000, is in Broadway, corner of Monument street. This will form a part of the medical department of the university. Another fine educational building is the State Normal School, corner of Carrollton avenue and Townsend street. The Enoch Pratt Free Libra-

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ry is a handsome white marble structure opened 1885, having 25,000 vols., besides four branch libraries. The Meth. Female Seminary is a handsome granite structure in St. Paul street. Among charitable institutions are the Maryland Institution for the instruction of the blind, a fine marble building, the Episcopal Church Home, the State Insane Asylum, comprising massive granite buildings about 6 m. out of the city, the Sheppard Asylum for the insane, 7 m. from the city, founded by a wealthy Quaker named Moses Sheppard, the Mount Hope Retreat, 4 m. from the city, designed for the insane and sick, and the Bay View Asylum, a large brick building near the city limits.

In the neighborhood of B. there is found a deposit of the finest brick clay known, and from this more than one hundred millions of bricks are manufactured annually. The largest rolling mills in the country are the Abbott Iron Works, situated on the e. side of the city. B. had 1902, 19 national banks (cap. \$12,403,260, surplus, \$8,013,050, undivided profits \$1,504,522; 16 state banks; 18 private banks; and 5 investment and loan companies (authorized cap. \$6,000,000); 780 m. of streets; water reservoirs of 2,274,000,000 galls. capacity; police force of 785 men; fire dept. of 279 men and 28 engines; and 77 periodicals of all kinds. Educational facilities are afforded by 3 universities, several colleges, the State Normal School, besides numerous private schools and academies and an academy of art and science. In 1883, Oct., in response to a request from the board of commissioners of the public schools of B. a city ordinance was adopted authorizing and directing the establishment, in some convenient locality as near the centre of the city as possible, of a school for manual training, to be open free to the children of the citizens and *bona fide* residents of the city, but permitting pupils from other places to be admitted on such terms and conditions as the board of commissioners should prescribe. The schools of B. are controlled by a board of 20 school commissioners, appointed by the city council for four years, five going out each year. The board appoints a superintendent of public instruction for the city, who serves four years, devoting his whole time to the work; likewise an assistant superintendent. The report of the U. S. commissioner of education for 1894 shows 110,731 children of school age (6 to 21 years). In 1894, the board of commissioners reported 124 school buildings, with a seating capacity of 70,100; and value of all property for school use \$2,531,158; 1,417 female and 134 male teachers; 4 male and 2 female supervising officers. The City College has a library of 8,000 vols. The grounds and buildings of the Eastern Female High School at B. are valued at \$80,000. The total enrolment of pupils in these was 72,980, of whom 49,135 was the average daily attendance.

The State College includes the high school for boys, and its full course comprises five years, upon the completion of which graduates are admitted to the Johns Hopkins Univ. without further examination. At the commencement in 1884, 14 were graduated. There is also a one-year commercial course, from which 56 were graduated in that year. In

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the girls' high school the course is four years, the studies including modern languages and such other branches as are usually taught in seminaries of the higher grade for girls. In addition to diplomas, the 7 highest graduates of the college and 15 highest in the high school receive prizes from the trustees of the Peabody Institute. Of the 67 school buildings reported 5 were rented, and 62 owned by the city were valued at \$1,195,811. The school houses of B. are built only two stories high, on a theory that they are better for health and easier of egress in case of panic. In the 4 evening schools for whites there were 20 teachers and 891 pupils (8 to 24 years of age), with an average attendance of 524 ($63\frac{4}{10}$ per cent.), while in the 4 colored there were 17 teachers and 987 enrolled, with an average attendance of 481 ($55\frac{4}{10}$ per cent.). In the 14 schools for girls, including the high school, there were enrolled 4,910, with an average attendance of 3,990, $83\frac{6}{10}$ per cent., under 107 teachers.

The Manual Training School was opened in connection with the public schools, 1884, March, and is reported to have been eminently successful. The course requires three years, and omits from the necessary studies foreign and ancient languages, giving prominence to mechanical drawing, scientific instruction, and practice in the use of tools in carpentry, wood-turning, pattern-making, iron chipping and filing, forge work, soldering, and the English branches of the high school course. One hour a day is spent in drawing, two hours in shop work, and the remainder of the school day in study and recreation. Before graduating each pupil is required to construct a machine, the drawing and patterns of which must be made by himself. The first session opened with 50 students, and closed with 150.

In 1894 there were 110,731 children of school age; total enrolment 72,980; average daily attendance 49,125; total number of buildings 124; total number of sittings 70,100; expenditures for school purposes \$1,207,229.

There are also ten kindergartens in B., but these do not belong to the public school system.

The Maryland State Normal School for training teachers has a normal course covering 3 yrs. 9 months. Connected with the Normal School is a model school, and vocal music, drawing, and calisthenics are taught. The school is free to 200 state students. In 1901 there were 29 men and 436 women students under 16 instructors, the number of graduates being 86. The state appropriation for this school is \$10,500. The Baltimore Normal School for the education of colored teachers offers a course of 4 years of 41 weeks. In 1901 there were 53 students, the majority of whom were taking the English course. There is also the Centenary Biblical Institute, which is a normal department of the Thereseum (Rom. Cath.), a training school for female teachers. The Johns Hopkins University has no defined course of instruction. It offers two distinct departments, collegiate and university. At the end of 1902 there were 144 instructors, 694 students,

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105,000 vols. in the library, and 1,422 graduates. The Maryland Institution for the instruction of the blind is for white youth between the ages of 8 and 19 years. It gives instruction in the common English courses and music, with broom and mattress making, sewing, knitting, etc. The attendance, 1900-1, was 101. The institution for the colored blind and deaf mutes is exclusively for education and is not an asylum. In 1900-1 the number of pupils was 25, of which number 20 were males and 5 females. The McDonough Institute has for its object the education and moral and physical training of the poor boys of the city. The age of admission is 10 to 16 years, and the sessions cover ten months of the year. In 1900-1 there were 150 boys in the institution, under 11 instructors. St. Mary's Industrial School for boys had that year an enrolment of 560. The industries taught are printing, shoe-making, tailoring, carpentry, blacksmithing, painting, basket-making, iron smelting, and baking.

B. is supplied with water by an artificial pond 8 m. n. of the city, known as Lake Roland, which has a capacity of 500,000,000 gallons, and is fed by Jones's Falls. There are also three other reservoirs for supplying B., these latter having an aggregate capacity of about as much as Lake Roland, and there are a number of other small streams and fountains. B. contains a number of fine hotels, including the Hotel Renert, the St. James, the Mount Vernon, Guy's, the Carrolton, Barnum's Hotel, the Eutaw House, the Howard House, the Mansion House, and the Maltby House.

Every part of the city is rendered easily accessible by horse-cars and stages, and there are public carriage-stands at the depots and in various parts of the city. Street-cars run to the following suburban places: Franklin, Catonsville, Towson town, Pimlico, Peaksville, and Highlandtown. There is also the Maryland Central narrow-gauge railroad, which extends to Long Green, Harford road, and Bellair. The important railroad depots are the Union, the Philadelphia Wilmington and Baltimore, the Western Maryland, the B. and Potomac, the Northern Central, and the Catonsville. The bonded debt (1901), Jan. (including \$8,500,000 water bonds) was \$40,164,683; sinking fund and other assets \$9,315,977; net debt \$30,848,705. A new series of public improvement bonds amounting to \$6,000,000 was authorized early in (1893) The assessed valuation (1902) was, real about \$257,845,659, personal \$171,805,767; total \$429,651,426, and the tax-rate state \$1.75, city and school \$15.50, total \$17.27½ per \$1.000.

In order of population B. in 1890 was the seventh city, in the United States. Its progress is shown by the census as follows: (1790) 13,503; (1800) 26,514; (1810) 35,583; (1820) 62,738; (1830) 80,625; (1840) 102,313; (1850) 169,054; (1860) 212,418; (1880) 332,190; (1890) 434,439; (1900) 508,957.

BALTIMORE, CECILIUS (or CECIL) CALVERT, second Lord B.: abt. 1605-1675, Nov. 30; son of the first Lord B. Of his place of birth and early history nothing is cer-

BALTIMORE—BALTIMORE BIRD.

tainly known. His wife, Ann Arundel, whom he married abt. 1623, gave name to a Md. co. On his father's death 1632 the charter for the Md. plantation was issued to Cecilus; and 1633 he dispatched to the new domain a band of colonists under the direction of his bro. Leonard Calvert (q.v.), whom he appointed his *locum tenens* in the govt. of the colony. Cecilus never visited the Md. settlements, which for 43 years of his life were governed by his deputies. His instructions to his deputies regarding their dealings with the aborigines and the settlers evinced a wisdom and a moderation that were universally commended.

BALTIMORE, CHARLES CALVERT, third Lord B.: 1629-1714, Feb. 24: b. London; son of the second Lord B. He was governor of Md. for his father 1662-75, when he became lord proprietary and continued to govern the colony in person till 1684, when he returned to England. During his governorship the peace of the province was continually disturbed by acts of resistance on the part of the settlers to the exercise of feudal rights by the lord proprietary under the charter, and by the machinations of the adherents of the Anglican Church, whose aim was to constitute that the established church. By withstanding their demands Lord B. greatly promoted religious toleration, and as a necessary consequence religious liberty in the English colonies in America.

BALTIMORE, GEORGE CALVERT, first Baron B.: abt. 1582-1632, Apr. 15; b. Kepling in Yorkshire, Eng. He graduated at Oxford 1597, and then, after return from foreign travel, became sec. to Robert Cecil, and afterward clerk of the privy council. He was a sec. of state when, 1617, he received from James I. the honor of knighthood. The king bestowed on him a pension 1620. Having become a member of the Rom. Cath. Church, he resigned the secretaryship of state 1624; but was in such favor with James that he still remained privy counselor. He was made an Irish peer 1625, with the title Baron B. He had long taken an interest in American colonization and was a member of the Virginia Company. A patent was granted him 1621 by which he became lord proprietary of the s. promontory of Newfoundland, to which he gave the name Avalon. The scheme of colonizing Avalon proved a costly failure, and the land concession was abandoned. James's successor, Charles I., then made a grant to B. of all the territory in the present states of Md. and Del.; but before the patent could be engrossed Lord B. died. The charter or patent contemplated the establishment of a modified feudal system, with hereditary landlord aristocracy, tempered by an assembly of freeholders, whose consent was a prerequisite for the validity of all laws. In the *Proceedings* of the Md. Hist. Soc. (1880) is a list of books relating to the life of the first Baron Baltimore.

BALTIMORE-BIRD, or BALTIMORE ORIOLE (*Ic'terus Baltimorii*): a very beautiful bird, found in all parts of the United States as far n. as 55° n. lat., but migrating to



Baltimore-bird or Baltimore Oriole.



The largest of the Figures at **Bamian**.

BALTIMORITE—BALUSTER.

tropical or sub-tropical regions in winter. It belongs to the family *Icteridae*, blackbirds, etc., or American starlings. The B.-B. is in size somewhat larger than the black-and-chestnut Orchard Oriole; the bill conical, very acute, and a little curved; the plumage brilliant, particularly in the adult males, glossy black finely contrasting with bright orange and vermillion; the tail longish, rounded, and slightly forked. The bird is remarkably active; its song extremely agreeable. Its nest is a curious and interesting structure—a pendulous cylindrical pouch six or seven inches long, usually suspended from two twigs at the extremity of a lofty drooping branch; the materials, which vary according to circumstances, woven together with great nicety, and sometimes sewed through and



Baltimore-Bird, and nest.

through with long horse-hairs. Thread, which may happen to be bleaching, is very liable to be appropriated for nest-building.

The nests of other species of *Icterus* are also pensile. Several are natives of N. America, and others of S. America. They are quite distinct from the true Orioles (q.v.).

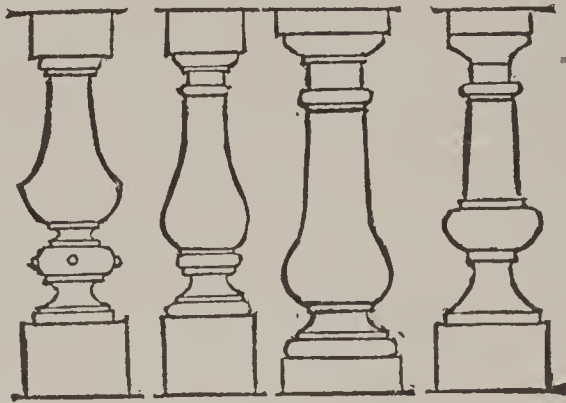
BALTIMORITE, n. *bawl-tĭ mōr'īt* [from *Baltimore*; suff. *ite*]: a mineral, considered by Dana as identical with Picrolite. It is composed of longitudinal fibres, adhering to one another. Its lustre is silky. When thick, it is opaque, but when thin, transparent on the edges.

BALTSCHIK, *bālt shēk'*, or **BALDIK**, *bāl-jēk'*: a town of Bulgaria, Turkey, 18 m. n.e. of Varna; noteworthy as near the ruins of Tomi, whither Ovid was exiled.

BALUSTER. n. *bāl'ūs tēr* [F. *balustre*—from It. *balaustrō*: Sp. *barauste*, corrupted into *balaustre*—from *baravara*, a rod]: one of a row of small columns or pilasters set

BALUSTRADE—BALZAC.

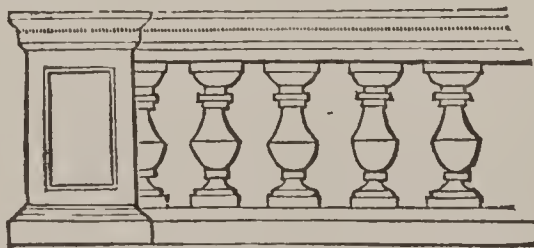
in line as supports to a cornice or coping, or as guards to a stairway (when it is often corruptly spelt *banister*). These miniature pillars either have generally a pear-shaped swelling at the lower end, or consist of two pear-shaped pieces,



Balusters.

one above the other, a ring of moldings being set between them. This makes the profile resemble an ancient bow or Ballista (q v.), from which some derive the name; other derive it from Lat. *palus*, Eng. *pole* or *pale*. BALUSTERED, a. *băl'ūs-têrd*, furnished with balusters.

BALUSTRADE, n, *băl'ūs-trād* [F.]: a row of little pillars united by a coping, serving as a fence for staircases, a parapet for bridges, the roofs of large edifices, etc., or as a mere termination to the structure, or to inclose stairs,



Balustrade.

altars, balconies, etc. Balustrades are made of stone, metal, or wood.

BALZAC, *băl-zăk'* or *băl'zak* HONORÉ DE: one of the best of modern French novelists: 1799, May 20—1850, Aug.; b. Tours, where his father held a civil office. At the age of twelve, he entered the college of Vendôme, but finished his studies at the Pension Lepitre, in Paris. B. early in his career wrote about 30 volumes, under the names St. Aubin, M. de Veillergré, St. Alme, etc. He received some trifling assistance in writing these novels, which were so unsuccessful that he lived in great poverty. In 1826, he entered into partnership with the printer Barbier, and published various works; but the speculation turned out so ill, that he fell into debt, and returned to book-making. His perseverance was admirable. Although long utterly unsuccessful, he continued to write until he opened a path for himself by his novel *Les Derniers Chouans, ou la Bretagne en 1800* (Par. 1829). In this book he abandoned for

BALZAC—BAMBARRA.

the first time the manner of Pigault and Lebrun, which he had hitherto adopted. Among his best works are the *Physiologie du Mariage* (2 vols. Par. 1831), *Scènes de la Vie Privée* (5 vols. 1831), *Scènes de la Vie de Province* (1832), *Scènes de la Vie Parisienne* (1832), *Le Médecin de Campagne*, *Le Père Goriot*, *La Peau de Chagrin*, *La Recherche de l'Absolu*, which were all received with much favor by the public. Of all his novels, two only can claim artistic completeness; the *Histoire Intellectuelle de Louis Lambert*, and *Eugène Grandet*. His other works suffer more or less from unnaturalness, diffuseness, and the want of a solid knowledge of the world, although there is great richness of description in portraying individual features of character, as drawn directly from the heart. B. has immense power over his female readers. In his *Contes Drôlatiques, colligez ès Abbayes de Touraine, et mis en lumière par le Sieur de Balzac pour l'esbattement de Pantagruelistes et non aultres* (2 vols. Par. 1833), he follows exactly in the footsteps of Rabelais. Success made B. conceitedly ambitious. He thought himself equal to the most distinguished authors of all time, and represented the aim of his literary activity to be, to give a complete picture of human life in all its varied phases. Some recent English and American critics incline to place him in the highest rank of novelists. As a dramatic author he decidedly failed. A collected edition of his works in 45 vols. was published in Paris, 1856-59. An English translation of his Letters, with a Memoir by his sister, was issued in 1878.

BALZAC, JEAN LOUIS GUEZ DE: 1594-1655, Feb. 18, b. Angoulême. In youth he was secretary to Cardinal la Valette at Rome, whence he returned to Paris and devoted himself to the refinement of his native language. He has a permanent place in French literature, for though his writings have little intrinsic worth, they heralded the splendid phalanx of genius which adorned the age of Louis XIV. He was a favorite of Cardinal Richelieu, a member of the French Academy, a councilor of state, and historiographer. His violent literary disputes with Father Goula caused him to leave Paris and retire to his hereditary property of Balzac. A collection of his works appeared in Paris, edited by L'Abbé Cassaigne (2 vols. Par. 1665; 3 vols. Amst. 1684). Of all his works, his *Lettres* (4 vols. 1806-74), have been most admired, and are still read. Selections from his writings were arranged by Malitourne (1882) and Moreau (1854). See Moreau de Mersan's *Pensées de B.* (1807).

BALZARINE. n. *bălz'a-rên* [F.]: a light mixed material of worsted and cotton, for ladies' dresses.

BAMBARRA, *băm-băr'ra*: one of the states of Sudan, western Africa, lying, so far as has been ascertained, between lat. 12° and 14° n., long. 15° e. and 5° w., and occupying both sides of the Joliba or Niger, which flows through its centre from s.w. to n.e. The principal towns of B. stand on the banks of this river. The mountains in which the Niger has its source divide it on the s. from Guinea; the Sahara desert bounds it on the n.; on the w.,

BAMBERG.

Senegambia; and on the e., some of its sister-states. In general the country is said to bear considerable resemblance to the agricultural districts of England; but in the w. there are low chains of granite hills, continuations of the highlands from which the Niger springs. The climate in some parts is intensely hot; in others, more temperate, but generally healthful. The rainy season lasts from June to November. The land is well watered and fertile. Double crops of corn, rice, maize, yams, etc., are raised annually without much labor.

The butter-tree, cotton-tree, oil-palm, baobab, and date are among the most important indigenous growths. The manufacturing industry of B. is important; the women making a soft coarse cloth, much esteemed for its beautiful blue color, and the men articles in gold, iron, and ivory, in which much trade is carried on. The inhabitants, chiefly Mandingoes, are said to be superior to their neighbors in intelligence, and to be much sought after as warriors by the petty chiefs around them. They generally lend their assistance on condition of a certain payment. The upper classes profess Mohammedanism; the lower are pagans. The introduction of Mohammedanism has had at least one good effect, supplying the native dialect with a written speech through the use of Arabic letters. The chief domestic animals are horned cattle, goats, sheep, and fine horses. The wild animals are lions, leopards, elephants, wolves, panthers, etc.; and venomous reptiles, of which the natives are much afraid. Crocodiles are numerous in the rivers, which abound also with fish. The principal towns are Sego, Sansanding, Yamina, and Bammaku, all populous. The country has a nominal monarch, but it is in reality ruled by several chiefs.

BAMBERG, *bām'bērg*: city of Bavaria, district of Upper Franconia, beautifully situated on the banks of the Regnitz, not far from its confluence with the Main, in the midst of vineyards, orchards, and hop-gardens. B., which has considerably declined in importance since the Reformation, is a city of considerable antiquity, having originated, it is said, with a colony of Saxons, 804. The most noteworthy of its public buildings is the cathedral, a magnificent edifice in the Byzantine style, founded by the emperor Henry II. 1004, and restored after fire in 1110. It contains, among other monuments, the elaborately carved tomb of the founder and his empress, Cunigunda. Attached to the cathedral is a library, with valuable missals and manuscripts, and what is represented to be the prayer-book of Henry II. There are several other fine ecclesiastical structures of early date, and the old palace of the former prince-bishops of Bamberg. The ruins of the castle of Altenburg, originally the seat of the Counts of Babenberg, and the scene of many important historical events, stand on an eminence about a mile and a half from the town. The educational institutions of B. are numerous. The people are largely engaged in the manufacture of beer, which is famous throughout Germany; also of cotton, cloth, gloves, musical instruments, etc. A large

BAMBINO—BAMBOO.

export trade in licorice and garden-seeds is carried on. Pop. (1890) 35,248; (1900) 41,820.

BAMBINO, *bám-bě'nō*: the swaddled figure of the infant Saviour, which, surrounded by a halo, and watched over by angels, occasionally forms the subject of altar-pieces in Rom. Cath. churches. The *Santissimo* B., in the church of the Ara Cœli at Rome, is held in great veneration for its supposed miraculous power of curing the sick. It is carved in wood, painted, and richly decorated with jewels and precious stones. The carving is attributed to a Franciscan pilgrim, out of a tree that grew on Mount Olivet, and the painting to Luke the Evangelist. The festival of the B., at the Epiphany, is attended by great numbers of country people, and the B. is said to draw more in the shape of fees than the most successful medical practitioner in Rome.

BAMBOCCIADES, *bām-bōk'sē-ādz*, in Painting: grotesque scenes from common or low life—such as country-fairs, penny-weddings, boors merry-making. The name is derived from Peter van Laar, a painter, who, on account of his personal deformity, was surnamed Bamboccio (Cripple); but he was not the first painter of such scenes.

BAMBOO, n. *bām bō'* [Malay, *bambu*], (*Bambusa*): genus of gigantic tree-like grasses with hollow, jointed stems. Some species attain great size, many of them 20 or 30 ft., some 70 or 100 ft. in height. The species are numerous, in tropical and subtropical regions, both of the eastern and of the western hemispheres. They have important uses. All of them have a jointed subterranean root-stock (rhizome), which throws up 10–100 stems. These are generally straight and erect; although one large species (*B. agrestis*), common in dry mountainous situations in the s.e. of Asia, has crooked, and sometimes creeping stems. The stems grow to their full height unbranched, but afterwards throw out straight horizontal branches, especially in their upper parts, forming a dense thicket; and many of them being strongly armed with spines, they are planted for defense, presenting a formidable barrier, even against regular troops. Some of the smaller kinds are often planted as hedges. The stems are jointed like those of other grasses, very hard, but light and elastic, hollow, containing only a light spongy pith, except at the joints or nodes, where they are divided by strong partitions. They are, therefore, readily converted into water-vessels of various sorts; and when the partitions are removed, they are used as pipes for conveying water. They are also much employed for house-building, for bridges, etc. The smaller stems are converted into walking sticks, and are imported into Europe under the name of B. cane, both for that purpose and to be employed in light wicker-work. In China, the interior portions of the stem are used for making paper. Some of the species grow to the height of only a few feet; and almost all of them are slender in proportion to their height, although *B. Guadua*, a native of New Granada and Quito, has a trunk 16 inches in diameter. The stems of different

BAMBOO.

species vary also very much in the thickness of the woody part, and so in their adaptation to different purposes. The external covering of the stem is, in all the species, remarkably siliceous; the stem of *B. tabacaria* is so hard that it strikes fire when the hatchet is applied. This species is a native of Amboyna and Java; its slender stems are polished, and used for the stalks of tobacco-pipes. The leaves of some kinds are used for thatch, and the Chinese plait hats of them; of the external membrane of the stems of some, they make paper. From the knots of the B. there exudes a saccharine juice, which dries upon exposure to the atmosphere, and which the Greeks called *Indian Honey*. It is also sometimes named *Tabaris* or *Tabasheer*; but this name more properly belongs to a phosphorescent substance, containing silica and lime, and possessing remarkable properties, which forms in the joints of some species of B., and of other



Bamboo.

large grasses growing in dry situations. *See TABASHEER.* — The young shoots of some kinds of B. are eaten like asparagus, or are pickled in vinegar. Those of *B. Tulda*, a common Bengalese species, are used for these purposes when about 2 ft. long. The seeds of some species are used as rice, and for making a kind of beer. Bamboos are generally of very rapid growth, and they are often found in arid situations, which would otherwise be destitute of vegetation. It is not improbable that they may yet be employed, where they do not naturally abound, to render districts productive which are now little else than deserts, in climates like those of Arabia, the N. of Africa, and Australia; and the quality of the grain of different species seems to deserve more attention than it has ever received. The species common in the West Indies (*B. vulgaris*) is supposed to have been introduced from the East Indies. A few species are found in

BAMBOOZLE—BAMBOUK.

the Himalaya, at a height of 12,000 ft., and a dwarf species from that region has been successfully tried in the open air in England.

BAMBOOZLE, v. *băm-bô'zł* [It. *bamboccio*, an old dotard or babish gill: Dut. *bum*, to hum; and *baesen*, to rave or talk idly: Scot. *bumbazed*, puzzled, astonished]: to make fun of a person; to cajole by confusing the senses; to deceive; to confound; to mislead. **BAMBOO'ZLING**, imp. **BAMBOO'ZLED**, pp. *-zld*.

BAMBOROUGH CASTLE, *bam'bŭr-rŭh*: one of the oldest castles in Britain; on the n.e. coast of Northumberland, opposite the Farne Isles (q.v.). On its site Agricola is said to have built a Roman fortress. According to the Saxon Chronicle, Bamborough Castle was erected by Ida, first Saxon king of Northumbria, 550. It appears to have been a royal residence for long after. In 642, it was unsuccessfully besieged by Penda, King of Mercia; and during the Danish descents on England it was twice partly demolished. In 1095, Mowbray, Earl of Northumberland, fell into the hands of William Rufus, who had lured him to Newcastle; and his countess surrendered the castle under the threat of his eyes being put out. When Northumberland was granted to Henry, son of David of Scotland, Bamborough Castle was reserved for the English crown, and here Baliol acknowledged Edward I.'s supremacy in 1296. During the Wars of the Roses, it was the scene of several conflicts, and so battered and destroyed that it has not been used since as a fortress. In the time of Queen Elizabeth, its governor was Sir John Forster, in whose family it continued till 1716, when it was bought, with the Forster estates, by Lord Crewe, Bp. of Durham, who left it with other property to trustees for benevolent purposes. One of these, the Rev. Dr. John Sharpe, bequeathed his library to the institution. The income, abt. £9,000, is expended in providing a market for the sale of provisions and groceries to the poor at prime cost; a dispensary for gratuitous advice and medicines to the sick; funds for maintaining, educating, and starting in life poor children of the district; lifeboats and apartments for shipwrecked sailors; a constant patrol during stormy nights for 8 miles along the coast; repairing churches, and aiding young men at the universities. Bamborough village, near the castle, was a royal borough before the Conquest, and in the time of Edward I. returned two members to parliament. Pop (1871) 320; (1891) 3,751.

BAMBOUK, *băm-bôk'*: a country of Senegambia, w. Africa, in the angle formed by the Senegal and Faleme rivers; roughly estimated at 140 m. in length, and from 80 to 100 in breadth. The climate is unhealthful, especially during the rainy season; but the valleys are remarkable for their fertility. Trees common to w. Africa here attain enormous proportions. Vast herds of wild oxen roam the hills, and most of the wild animals of Africa abound. B. is remarkable for its gold, which the natives exchange for salt, cotton, and other manufactured goods. Its inhabitants, the Man-

BAMBUSA—BAMPTON LECTURES.

dingoes, are professedly Mohammedans, but they cling to many pagan superstitions, and are very ferocious. Four centuries ago, B. was for a short time in the possession of the Portuguese.

BAMBUSA, n. *băm-būz-a* [Latinized from the Mahratta or Malay word *bamboo*]: genus of grasses, type of the section *Bambuseæ*. It contains the well-known Bamboo or Bamboo-cane, *Bambusa arundinacea*. Other species from Asia and the adjacent islands are *B. maxima*, 100 ft. high, from the Malay archipelago; *B. aspera*, from *Amboyna*, 60 or 70 ft.; and *B. apus*, from Java, of as ample dimensions. The American species are less numerous, but *B. latifolia*, from the Orinoco, is very fine.

BAMIAN, *bâ mē-ân'*: a fruitful valley and pass of Afghanistan, leading from Cabul to Turkestan; about a mile in breadth, enclosed by steep rocks. It is at an elevation of 8,496 ft., and is the only known pass over the Hindu Kush for artillery and heavy transport. It was one of the chief centres of Buddhist worship, and with its two colossal statues was described by the Buddhist monks who visited India in the 4th and 5th c. The statues are found on a hill about 300 ft. high, in which are a multitude of cells excavated in the rock all round, and rising above one another in irregular tiers. The male figure is about 160 feet, the female 120. Both are natural in attitude, and clothed in light drapery; the face of the former is the most perfectly preserved. Each figure is hewn out of a deep niche, also elaborately carved, and representing royal personages and a variety of symbols which resemble those on the coins of the Sassanidæ. Each contains a winding stair by which it is possible to ascend to the head. The whole valley is covered with the ruins of tombs, mosques, and other buildings, once belonging to the town of Ghulghuleh, which more recently occupied this site, and was destroyed by Genghis Khan, 1221. Eight m. e. of B. is the ancient fortress of Zohak, attributed to the fabulous Persian Serpenterking of that name. The fortress is preserved for the purpose of guarding the important pass. Both there and in the valley of B., a great number of coins, ornaments, and other antiquities have recently been found, and fully described by Mas-on, Wilson, Prinsep, Wood, and others.

BAMLITE, n. *băm'lit* [after *Balme* in Norway, where it occurs]: a mineral, a variety of Fibriolite, white or grayish in color, and columnar in form.

BAMP'TON: small town in the n.e. of Devonshire, chiefly on the left bank of the Batham, a tributary of the Exe; 22 m. n. of Exeter. There are here extensive carboniferous limestone quarries. The manufacture of serge and pottery is carried on. St. Michael's Church was built in the 14th c., and has a tower 70 ft. high. Pop. (1891) 1,672.

BAMP'TON IN THE BUSH: small town in Oxfordshire, 14 m. s.w. of Oxford. It has an ancient cruciform church, with a large Norman tower, and examples of every period of the pointed Gothic style. Pop. (1871) 764; (1891) 1,346.

BAMP'TON LECTURES: founded by the Rev. John

BAMPTON LECTURES.

Bampton, Canon of Salisbury, who left estates originally worth £120 per annum, to the University of Oxford, for the endowment of eight divinity-lecture sermons, to be preached at Great St. Mary's every year, and to be published, at the expense of the estate, within two months of their being preached. The preacher is to lecture on one of the following subjects: The Confirmation of the Christian Faith, and the Confutation of all Heretics and Schismatics; the Divine Authority of the Scriptures; the Authority of the Primitive Fathers in Matters of Christian Faith and Practice; the Divinity of Christ; the Divinity of the Holy Ghost; the Apostles' and Nicene Creeds. No person is qualified to preach these lectures who has not taken the degree of M.A., either at Oxford or Cambridge, and the same person shall never preach them twice. The first course was delivered 1780. In 1834-35, no lecturers were appointed, and no lecture was preached in 1841. With these exceptions, there has been an unbroken series of very valuable, but rather learned than popular, discourses. The most remarkable are the following: Those delivered 1784, on Christianity and Mohammedanism, by Dr. White, who was accused of having obtained assistance in their composition from Dr. Parr and Dr. Badcock; those by Dr. Tatham, 1790, on the Logic of Theology; those of Dr. Nott, 1802, on Religious Enthusiasm—this series was directed against the movement by Wesley and Whitefield; those of Dr. Maut, 1812; those of Reginald Heber, 1815; Whately, 1822; Milman, 1827; Burton, 1829, on the Heresies of the Apostolic Age; Soames, 1830, on the Doctrines of the Anglo-Saxon Church. But of the whole series, none have caused greater excitement and controversy than those delivered by Dr. Hampden, 1832, on 'The Scholastic Philosophy considered in its Relation to Christian Theology.' They were attacked on all sides, but especially by the leaders of the Oxford Tract Association. Hampden was accused of Rationalism and Socinianism. When he was appointed Regius Professor of Divinity, 1836, a petition against his appointment was sent up to the throne; and upon this being rejected, a censure was passed upon him in convocation by a large majority, declaring his teaching to be unsound, and releasing undergraduates from attendance at his lectures. Notwithstanding this, he was raised to the see of Hereford, 1847, under the government of Lord John Russell—thirteen of the bench of bishops protesting against the appointment. The course of Bampton Lectures delivered by the late Dean Mansel, 1858, on 'The Limits of Religious Thought,' caused a less bitter, but scarcely less interesting controversy. Mr. Mansel had great power as a dialectician, and his lectures contained many very eloquent passages. The main position which he took up was, 'That the human mind inevitably, and by virtue of its essential constitution, finds itself involved in self-contradictions whenever it ventures on certain courses of speculation,' i.e., on speculations concerning the infinite nature of God. He maintained that all attempts to construct an objective or metaphysical theology must necessarily fail, and that the attainment of a philosophy of the

BAMPURA—BAN.

Infinite is utterly impossible, under the existing laws of human thought—the practical aim of the whole course being to show the ‘right use of reason in religious questions.’ Mr. Mansel was accused by his critics of condemning *all* dogmatic theology (e.g., all creeds and articles), and of making revelation itself impossible. Mr. Maurice was one of his principal opponents. Canon Liddon’s lectures, 1866, on our Lord’s Divinity, have been the most important since Dean Mansel’s. The Bampton Lectures 1874 were delivered by the Rev. Stanley Leathes, on ‘The Religion of the Christ;’ in 1879, by Mr. Wace, on ‘The Foundations of Faith;’ and in 1880, by Mr. Hatch, on ‘Early Christian Organization.’

A course of lectures similar to the Bampton was founded about the same time at Cambridge by the Rev. John Hulse. See HULSEAN LECTURES.

BAMPURA, or **BHAMPURA** *b’ham-pô’rá*, or **BHANPURA**, *Bhan-pô’rá*: town of Hindustan, territory of Indore; on the Rewa, 1,344 ft. above the sea; about 180 m. s.w. of Gwalior. It is at the base of a range of hills, is surrounded by a wall, and has an unfinished fort, stone, which encloses an unfinished palace. Both palace and fort were begun by Jeswunt Row Holkar, of whom there is a beautiful marble statue in the palace. B. is the principal place of a pergunnah containing 70 villages. Pop. 20,000.

BAN, n. *băn* [AS. *gebann*, a proclamation: L. *bannirē*, to call to the ban or standard, to make a signal (see **BANNER**): Sp. or It. *bando*, a decree, banns of marriage: mid. L. *bannum*, a proclamation: Sw. *bann*, excommunication]: originally a summons to the army; a public notice; a curse; a censure; an interdict; a sentence of outlawry; in Slavonia, Croatia, etc., the viceroy or lord-lieutenant (see **BAN** or **BANUS**): V. to curse; to interdict; to proclaim; in Germany, the *acht* or *bannum* was a sentence of outlawry pronounced in the middle ages against those who escaped from justice, or refused to submit to trial. Refractory princes and even cities were often placed under the *ban of the empire*. The following are the terms of banning used in an old formula: ‘We declare thy wife a widow and thy children orphans; we restore all thy feudal tenures to the lord of the manor: thy private property we give to thy children; and we devote thy body and flesh to the beasts of the forest and the fowls of the air. In all ways and in every place where others find peace and safety, thou shalt find none; and we banish thee into the four roads of the world—in the devil’s name.’ Besides these sentences of outlawry, many other announcements were accompanied with denunciations and imprecations; hence the origin of the popular use of the word. It occurs in this sense in Shakspeare and Milton, and other old writers. **BAN’NING**, imp. **BANNED**, pp. *bänd*. **BANS** or **BANNS**, public notice or proclamation in a church of an intended marriage. See **BANNS**. **BANAT**, n. *băn’ăt*, the territory governed by a ban. See **BANAT**. *Note*.—**BAN** in F. history designated the great vassals who held directly of the crown. **ARRIÈRE-BAN**, a corruption of mid. L. *heriban’*.

BAN—BANANA.

num—from Ger. *heer-ban*—from *heer*, an army, designated the tenants and followers of a *ban*, in the Slavonic tongues *ban* signifying a master.

BAN, or BA'NUS: supposed by some to be a contraction of the Illyric word *bojan*, i.e. lord, but more probably another form of the Slavonic word *Pan*, which has the same signification. Formerly, it was a title given to some of the military chiefs who guarded the eastern boundaries of the Hungarian kingdom, and was therefore synonymous with the German *Markgraf*. The ban, who was appointed by the sovereign, but not for life, and whose appointment had to be ratified by the national diet, had originally very extensive, in fact almost unlimited, powers. In political, judicial, and military affairs, he was the supreme authority. Within his own territory he exercised an influence similar to that of the Palatin in Hungary, and lower only than that of a king. In time of war, he headed the troops of his *Banat* (q.v.), and if the campaign occurred within its limits, it was his duty invariably to occupy the post of danger. He led the van to battle, or covered the rear in retreat. For these services he was recompensed partly in ready money, and partly by a monopoly of salt. The most important banats were those of Dalmatia, Croatia, Slavonia, Bosnia, Machow, and Szorény, but their boundaries changed so frequently that it is impossible to ascertain what they originally were. The encroachments of the Turks in the 16th c. rendered the union of the various banats necessary; and, after some time, the whole were formed into the double banat of Dalmatia and Croatia. A more complete unity was subsequently obtained by centralizing the military power. In 1723, the authority of the B. was made entirely subordinate to that of the supreme government of Hungary. After numerous vicissitudes, his powers, rights, and titles were strictly defined during the reign of Maria Theresa. He was then acknowledged to be the third dignitary of the Hungarian kingdom, appointed a member of the Hungarian council of government, and president of the council of the Banat, and at the coronation of the Hungarian king went before him bearing the golden apple, the symbol of sovereignty. Such was the position of the B. until 1849, March 4, when Croatia, Slavonia, and Dalmatia were transformed into Austrian crown-lands, and the B. made wholly independent of Hungary. In 1868, Croatia and Slavonia were reunited with Hungary. One of the Hungarian ministers superintends the affairs of the 'Kingdoms of Croatia and Slavonia;' while there is a special local administration for internal affairs. The head of this administration is called the Ban.

BANANA, n. *bă-nă'nă* [Sp. or Indian]: a herbaceous plant, originally East Indian, but much cultivated in nearly all tropical countries. It is now generally regarded as a mere variety of the Plantain (q.v.); although they were formerly ranked by botanists as distinct species, the Plantain under the name of *Musa Paradisiaca*, and the B. of *M. sapientum*—the specific name signifying 'of the wise

BANANA BIRD.

men,' and being intended to convey an allusion to a statement by Theophrastus concerning a fruit which served as food for the wise men of India, and which, from his description, is supposed to have been the plantain or banana. The names plantain and B. are somewhat vaguely used in their application to different cultivated varieties, which are very numerous; those called B. have generally dark purple stripes and spots on their stems, and the fruit is smaller, less curved, and of more delicate taste than the plantain, with a soft and luscious pulp. Each fruit is generally about four or five inches long. The B. is always used in a ripe state, and never like the plantain, as a substitute for bread; unless when the pulp is squeezed through a fine sieve, and formed



Banana.

into small loaves, which, when dried, may be kept for great length of time, but which are saccharine, and not farinaceous. It is sometimes fried in slices; it is often made into preserves; and its juice affords an excellent wine. It has been produced of good quality in hot-houses in temperate climates.—The fruit of *Musa Cavendishii* is sometimes also called banana. See PLANTAIN.

BANA'NA BIRD (*Xanthornus Icterus*): a beautiful bird, allied to the Baltimore-bird (q.v.), which it considerably exceeds in size; native of the West Indies and warm parts of America. Its colors are tawny and black, with white bars upon the wings. It is very lively. It is gregarious, and a number of the nests may often be seen near each other, suspended to the extremities of slender branches of trees, so as to be out of the reach of snakes and monkeys. It is often kept in houses to destroy insects. It is very easily domesticated, and delights to be caressed.

BANAS—BANBRIDGE.

BANAS, *bân'âs*, or BUNAS: name of three rivers in India.—1. A river of Rajpootana, rising on the w. frontier of Mewar, in the Aravulli Mountains, about n. lat. $24^{\circ} 47'$, e. long. $73^{\circ} 28'$. Flowing through Mewar 120 m., in a generally n.e. direction, receiving the Beris, or Beruch, on the right, and the Botaseri on the left, it passes the town of Tonk, where it changes its course to the s.e., and falls into the Chumbul in n. lat. $25^{\circ} 54'$, e. long. $76^{\circ} 50'$, after a total course of 320 m.—2. A river which also rises in the Aravulli Mountains, and after a s.w. course 180 m., is lost in the Runn of Cutch, ending in a number of small and intricate channels.—3. A river of Rewah, in Bundelcund, having a n.w. course abt. 70 m., and falling into the Sone near Rampur.

BANAT, *bâ-nât'*: any district or territory under a ban or chief, but applied specially to a province of the Austrian empire, which has, curiously, *no* ban. It is bounded on the w. by the Theiss; on the s., by the Danube; on the e., by the line of mountains which separates Hungary from Walachia and Transylvania; and on the n., by the Maros. It consists of the three Comitate, Temesvár, Torontál, and Kras-sowa. It is partly mountainous and partly flat, but everywhere copiously watered, and exceedingly fertile. The chief rivers are the Temes and Karasch. The climate is warm in summer, and comparatively cold in winter; but, though not unpleasant, it is far from salubrious in the west, on account of the swamps and morasses which abound. Nevertheless, it is the most productive of the Austrian provinces, yielding rich crops of wheat, spelt, and other grains; the vine is little cultivated. Wild-fowl are numerous, and the rivers swarm with fish. The mines are valuable; coal, iron, copper, gold, silver, and zinc being procured in considerable quantities. The mineral springs of Mehadia are in great repute. The principal town is Temesvár.

B. belongs to the Hungarian portion of the Austrian empire. It was formed into an Austrian crown-land, 1849, but was restored to Hungary, 1860. Pop. (1890) 1,500,000.

BANAWARAM, *bâ-nâ-wâr-âm'*: town of India, territory of Mysore, in a fine open country, among the headwaters of the Hugri, 81 m. n.w. from Mysore. It is a town of some antiquity. It was taken 1694, in a night-assault by Chika Deo, Rajah of Mysore. When it had fallen under the dominion of Hyder Ali, the inhabitants were in great part removed to Nagapuri, a new town which Hyder had founded in the vicinity. Previous to this removal, the pop. was about 10,000. The new town proving extremely unhealthful, the survivors of the people of B. were permitted to return to their old habitations.

BANBRIDGE, *bân'brîj*: small town in the w. of Down county, Ireland; on a steep slope on the left bank of the Bann, 76 m. n. of Dublin. It is a thriving seat of the linen manufacture in all its stages, from the preparation of the soil for the flaxseed to the finishing of the finest linen.

BANBURY—BANCROFT.

Miles of bleaching-greens exist in the vicinity, and numerous factories along the Bann. Pop. (1891) 4,901.

BANBURY, *ban'bér-e*: small town in the n. of Oxfordshire, on the right bank of the Cherwell, 23 m. n. of Oxford. Here was formerly a very strong castle, built about 1125, which sustained various sieges during the early English civil wars. At Danesmore, near B., the Yorkists were defeated, 1469. B. is the centre of the famous rich red land of Oxford county, among the most fertile in the kingdom. A system of canals connects the town with all parts of England. The vicinity is thickly studded with villages. Numerous remains of the ancient Britons are found in the neighborhood. B. is noted for its manufacture of agricultural implements, and for malt liquors, cheese, and cakes. There are also manufactures of plush, shag, girth, and other webbing. Till 1885 B. returned one member to parliament. Pop. (1871) 4,122, (1881) 3,600; (1891) 12,767.

BANC, SITTINGS IN: see BANCO.

BANCA, *bǎng'ka*: a Dutch island s.e. of Sumatra. It has a very rugged surface, one hill being 2,300 ft. high. Area, 4,894 sq. m.; pop. (1900) 106,305, of whom 204 were Europeans, 50,021 Malays, and 20,495 Chinese. Gold, iron ore, silver, lead, and amber are found, and the tin exported averages 4,500 tons.

BANCO, n. *bǎng'kō* [It. a bench, a bank]: a commercial term meaning the standard money in which a bank keeps its accounts, as distinguished from the current money of the place. The distinction was more necessary when the currency consisted, as it often did, of clipped, worn, and foreign coins. These the early banks (Venice, Amsterdam, etc.) received at their intrinsic worth, and credited the depositor in their books with this bank-value. The term was chiefly applied to the money in which the Hamburg bank kept its accounts, before the adoption of the new universal coinage of the German empire. It was not represented by any coinage. The Hamburg Mark B. (= \$0.355 sterling) was to the current mark (= \$0.29) as 20 to 16. Sweden had a peculiar bank-money, 8 dollars B. being equal to 3 dollars specie. Genoa had at one time a bank standard, and the present current money, being different from that, is still called 'fuori banco,' outside the bank. SITTINGS IN BANC or BANCO, so called when all the judges of the superior courts of common law are present, and occupy their respective seats or *benches*.

BANCROFT, GEORGE, PH.D., D.C.L., D.J.: historian: 1800, Oct. 3--1891, Jan. 17; b. Worcester, Mass.; son of the Rev. Aaron B. From Phillips (Exeter, N. H.) Acad., he went to Harvard, graduating 1817. For the next two years at the Univ. of Göttingen, Ger., he studied under Benecke, Bunsen, Eichhorn, Heeren, and Blumenbach. He received the degree of PH.D. from Göttingen 1820; and at Berlin and at Heidelberg applied himself to the study of history under Schlosser and others, returning to the United States 1822. For a year he taught Greek at Harvard, publishing a vol. of poems at Cambridge 1823; and

BANCROFT.

then joined Joseph G. Cogswell, afterward supt. of the Astor Library, New York, in founding the Round Hill school at Northampton, Mass., on the plan of Eton College, England. B. published translations of Heeren's *Politics of Ancient Greece, the States of Antiquity*, etc. (Boston 1824); and an oration in favor of universal suffrage 1826. He was elected to the legislature 1830, but refused to serve, having now formed and begun to execute the plan which was to result in his life work. He published Vol. I. of his *History of the United States*, Boston 1834, and Vol. II. 1837. In 1838 Pres. Van Buren appointed him collector of the port of Boston; 1844 he was nominated the democratic candidate for gov. of Mass., and was defeated by only a small vote. Pres. Polk appointed B. sec. of the navy; and his term of service, 1845, Mar. 10—1846, Sep. 9, was distinguished by his establishment of the U. S. naval acad. at Annapolis, Md. He forestalled future action by giving instructions for the seizure of California, in the event of a war with Mexico; and, as acting sec. of war, he also gave orders for the first occupation of Texas by the U. S. govt. B. was U. S. minister to Great Britain 1846-49, to Russia 1867, and to Germany 1868-74, when he asked to be recalled.* While at Berlin he prepared the argument of the United States against Great Britain in the Northwestern boundary case, which had been referred to the king of Prussia. During the long period of his govt. employment, B. had his home residence in New York, and continued at intervals to prosecute his great historical work, of which Vol. III. appeared 1840; Vols. IV.-X., 1852-74; and Vols. XI. and XII., entitled *History of the Formation of the Constitution of the United States*, 1882. A revised edition (6 vols.) was issued in Boston 1876; and a final revised edition (6 vols.) New York 1884-5. The *History of the United States*, though adversely criticised on some points, holds high rank in Europe and America, and has been strongly commended by such authorities as Edward Everett, Prof. Heeren, William H. Prescott, George Ripley, Baron Bunsen, and Friedrich von Raumer. The work begins with the earliest colonization and ends with the history of the formation of the constitution.

In 1854 B. established himself in Washington, and thereafter passed his time either in that city, or at Newport, R. I., his summer residence. He delivered numerous lectures and orations on historical and other subjects, including *The Culture, the Support, and the Object of Art in a Republic*; *The Office, Appropriate Culture, and Duty of the Mechanic*; *Memorial Address on the Life and Character of Abraham Lincoln*; *A Plea for the Constitution of the United States, Wounded in the House of Its Guardians*; etc. B. contributed to the *American Cyclopædia* a biography of Jonathan Edwards; also papers to the *Collections of the New York Historical Soc.* B. delivered public orations on the occasions of the death of Dr. Channing, Andrew Jackson, William H. Prescott, and Washington Irving; and at the unveiling, in Cleveland, O., of a statue of Oliver Hazard Perry. He also delivered an address, 1855, Oct.,

BANCROFT.

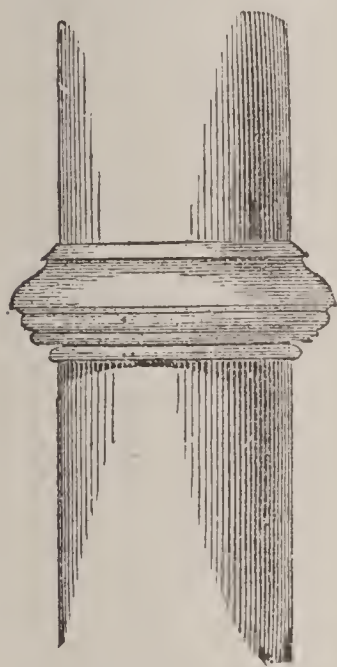
at the celebration of the battle of King's Mountain. His bodily and mental vigor remained scarcely impaired to extreme old age. He died in Washington, D. C.

BANCROFT, HUBERT HOWE: historian: b. Granville, O., 1832, May 5. He passed his early life on a farm, and had limited education. After serving in the book-store of his brother-in-law, George H. Derby, Buffalo, N. Y., he went to San Francisco, where, after many vicissitudes, he established 1856 the publishing house of H. H. Bancroft & Co., eventually the largest on the Pacific coast. Having formed a great collection of books, maps, and MSS. relating to the Pacific states, he determined to construct their history from these miscellaneous materials—a colossal undertaking which occupied him and his assistants 30 years, and resulted in the publication of 39 vols. at a cost of nearly \$700,000. This work appeared at different times and under several titles, as follows: *The Native Races of the Pacific States; History of the Pacific States; Essays and Miscellanies; Literary Industries*, etc. In 1886, B. met with a personal loss by fire, which was estimated to amount to \$500,000. His library of Pacific coast history and literature, stored in a fire-proof building in San Francisco, comprises 50,000 vols., and is invaluable, owing to the impossibility of ever reproducing it.

BANCROFT, RICHARD, Abp. of Canterbury: 1544, Sep.—1610, Nov. 2; b. Farnsworth, Lancashire; son of John and of Mary niece of Hugh Curwyn, Abp. of Dublin. Educated at Cambridge, he took the degree of B.A. at Christ's College 1567, and that of M.A. at Jesus' College 1570. He was known as a bitter opponent of the Puritans. He became rector of Teversham, Cambridgeshire, 1576, of St. Andrews, Holborn, 1584, and treasurer of St. Paul's Cathedral 1585. In the latter year, he was admitted D.D. By the lord chancellor, Hatton, to whom he was chaplain, he was presented to the rectory of Cottingham, Northamptonshire. In 1587, he became a prebendary of Westminster, in 1589 of St. Paul's, and in 1594 of Canterbury. Consecrated Bp. of London, 1597, May 8, he attended Queen Elizabeth during her last illness. At the famous Hampton Court conference under James I., he was one of the chief commissioners on behalf of the Church of England, and took the lead in the disputations. In the convocation of 1603, 4, he sat as president. In 1604, Oct., he succeeded Whitgift as Abp. of Canterbury; and was sworn in one of his majesty's privy council, 1605, Sep., and chancellor of the University of Oxford, 1608. B. had a high character as a preacher and statesman; and was a vigilant ruler of the church. He is author of two sermons, one of which, preached at St. Paul's, 1589, contains a furious invective against the Puritans, and of two treatises respecting church order and discipline. B. left his library to his successors in the see of Canterbury for ever.—His nephew, JOHN, Bishop of Oxford, 1632 (died 1640), built the palace of Cuddesden for the bishops of that see. Burned by the parliament troops, 1644, it was rebuilt, 1679.

BAND.

BAND, n. *bǎnd* [from the verb *to bind*: Goth. *bandi*; F. *bande*; It. *banda*, a strip, a band: Ger. *bande*, border, margin]: that with which anything is bound; a narrow strip of cloth or similar material for binding or swathing; a strip or streak of different color or material; a cord; a fillet; a tie; in *arch.*, a low molding; any kind of ornament con-



Band of a Shaft.

tinued horizontally along a wall, or by which a building is encircled. Bands often consist of foliage, quatrefoils, or of simple bricks. *B. of a shaft* is the molding or suits of moldings by which the pillars and shafts are encircled in Gothic architecture. Several bands are often placed at equal distances on the body of the shaft, when it is long, in which case they are known as shaft-rings: V. to join or tie together. **BAND'ING**, imp. **BAND'ED**, pp. **BANDAGE**, n. *bǎn'dāj* [F.], a fillet; a swathe; a long narrow strip of cloth used in binding up a wound or an infirmity: V. to tie up with a strip of cloth; to dress with a bandage. **BAN'DAGING**, imp. **BANDAGED**, pp. *bǎn'dājd*. **BANDBOX**, *bǎnd'bōks*, a slight paper box—so named from its original use

of holding bands. **BAND-KITT**, n., a large wooden vessel with a cover. **BAND'-SAW**, an endless steel belt, serrated on one of its edges, running over wheels, and rapidly revolved. **BANDLET**, n. *bǎnd'lēt*, or **BAN'DELET**, n. [F. *bandelette*, a little band]: in *arch.*, a flat molding or fillet. **BANDOLIERS** or **BANDAIEERS**, n. plu. *bǎn'dō lērz'* [F. *bandoulière*]: small wooden cases covered with leather, each containing powder sufficient for one charge of the *matchlock* formerly used; the shoulder-belts carrying ammunition formerly worn by musketeers. See **CARTRIDGE**. **BANDS**, two slips of lawn or fine linen hanging from the neck in front; a part of clerical dress, the only relic of the ancient *amice*, a linen vestment used in the ancient church to cover the shoulders and neck of the priest. In Britain it also forms a part of the full dress of the bar, the universities, and the leading functionaries in schools of old foundation. At Winchester and some other schools, it is even worn by the scholars. It is probably a relic of the ordinary civilian dress in the reign of James I.

BAND, n. *bǎnd* [It. *banda*; F. *bande*, a band or company: It. *bandare*, to side: Sp. *banda*, a side or party: F. *bander*, to join in league with]: a company of men united for any common object or design; a body of soldiers; a body of musicians: military bands are musicians in each infantry, cavalry, and artillery regiment in the U. S. army: they are enlisted and trained as soldiers, and are under the direction of the adjutant: V. to unite together in confederacy; to associate. **BAND'ING**, imp. **BAND'ED**, pp. **BAND'ER**, n. one who. **TRAIN-BANDS**, *trān'-bāndz*, regi-

BANDA—BANDA ISLES.

ments composed of citizens of a town, formerly drilled after the manner of the militia.—**SYN.** of 'band, n.': company; crew; gang; society; association.

BANDA, *băn'da*: chief town of a dist. in the N. W. Provinces; lat. $25^{\circ} 28'$ n., long. $80^{\circ} 22'$ e.; on the right bank of the Ken, an affluent of the Jumna, 95 m. to the s.w. of Allahabad, 560 to the n.w. of Calcutta, and 190 to the s.e. of Agra. It is a great mart for cotton. Pop. (1890) 23,071.

The district of B. contains 3,061 sq. m. Pop. (1890) 705,695.

BAND'AGE: a long strip of cloth used by surgeons to apply pressure on a part, or to retain dressings upon wounds. The most common B. is a strip of linen, calico, or elastic web, from 3 to 5 or more inches in breadth, rolled longitudinally; hence the name *roller*. There are bandages for special purposes, as the four-tailed for the head or knee, which consists of a piece of cloth split up on each side towards and nearly to the centre. When applied,



Bandage.

the tails are crossed and tied so as to make an extemporaneous night-cap. In applying the roller B. to a leg, the surgeon first turns it round the foot, then round the ankle and so by repeated turns, each one of which should overlap about a third of the previous one, till he reaches the calf of the leg, when he must fold at each turn the B. sharply back on itself, by which maneuver it will lie flat and smooth on the limb. The operator must remember that the B. must be applied more tightly at the foot than in the leg, so that it may not impede the course of the blood through the veins. This requires to be practiced, as the effect of a B. is always for good or evil as it is well or ill applied.

BAN'DA ISLES: a portion of the Moluccas, consisting of 10 islands, 50 m. to the s. of Ceram, lat. $4^{\circ} 30'$ s., long. $129^{\circ} 50'$ e. Area, only 17 sq. m. The Banda Isles are lofty and volcanic, attaining a maximum altitude of 1,745 ft. and having suffered greatly from earthquakes, of which the

BANDAJAN—BANDELLO.

most violent were in 1816 and 1852. Their chief production is the nutmeg. Like most of the islands in this neighborhood, they belong to the Dutch. Pop. about 6,500, 500 of whom are Europeans or half-breeds.

BANDAJAN': a pass over the Himalaya, forming the s. boundary of Kunawar. It is amid mountains of gneiss, and is covered with perpetual snow. The summit of the pass is 14,854 ft. above the sea, and is in n. lat. 31° 23', e. long. 78° 4'.

BANDANA, n. *băn-dăn'ă* [Sp. *bandaña*, a neckerchief; *banda*, a scarf, a ribbon]: a silk or cotton handkerchief, of Indian origin, now extensively made in Britain, usually of cotton. The cloth is first dyed turkey red, and then the pattern is made by discharging the color with bleaching liquor in a powerful Bramah press. The pattern to be discharged is cut out on two plates of such metal (lead) as may not be acted on by the liquor, and of the full size of the handkerchief. A dozen or more are put in at once between the plates, and so many of these courses are entered together as fill the press, when the pressure is applied, and the liquor is run in on the uppermost plate, which is grooved on the upper side to receive it, and holed to pass it from plate to plate through all the cloth-folds in the press. The pressure on the cloth, to make clean work by preventing the spreading of the liquor, is enormous. The patterns in the real B. style of printing are spots and diamond prints, the best suited for discharging, and even for these a pressure of 500 tons is required to work them clean. See CALICO PRINTING.

BAN'DA ORIEN'TAL: a state of South America. See: URUGUAY.

BANDEAU, n. *băn'dō* [F. a fillet, frontlet, diadem, tiara, architrave]: a narrow band or fillet around a cap or other head-dress.

BANDEL, *băn'děl*, ERNST VON: 1800-76, Sep. 25; b. Anspach: eminent modern sculptor. While attending the academy at Munich, 1820, he sent to the exhibition a plaster figure of Mars reposing, large as life, which procured for him considerable reputation. His figure of Charity, executed in marble, occupied about ten years. It exhibits great chasteness of design, and a minute carefulness of execution. Among his best portrait busts (in which he excels) are those of Maximilian, king of Bavaria (1832), and of the artists D. Quaglio and Peter Hess. In 1834, he removed to Berlin; where his chief works were a colossal statue of Hermann (q.v.), the foundations of which were laid 1841, but which was not inaugurated till 1875; a life-size statue of Christ; a life-size statue of Hermann's wife; and a bust of the poet Grabbe. At Hanover, where he long resided, he executed for the theatre statues of Shakespeare and Goldoni; for Göttingen, one of William IV.

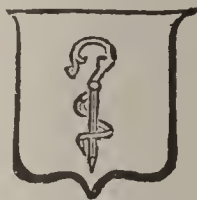
BANDELLO, *băn-děl'o*, MATTEO: abt. 1480-1561; b. Castelnovo, Piedmont: Italian writer of *novelle* or tales.

BANDE NOIRE—BANDICOOT.

In early life, he became a Dominican monk, in the Convent delle Grazie at Milan, but soon abandoned this vocation for a more free and independent life, and in Rome and Naples B. studied belles-lettres. He returned to Milan, whence he was driven by the Spaniards, as a partisan of France, after the battle of Pavia, 1525. He accompanied Francis I. to France, and was, 1550, made Bp. of Agen by Henry II. He left the care of his diocese to the Bp. of Grasse, and gave his time to the completion of his tales, pub. in Italian (3 vols. Lucca, 1554); a fourth vol. was added after his death. The tales of B. rank in Italy next to those of Boccaccio. They are distinguished by unaffected simplicity of style, fluency and vividness of narrative, and a harmonious brevity of periods. But their moral tone is often impure.

BANDE NOIRE, *bānd nwar* ('Black Band'): societies of capitalists who, during the first French revolution, bought the confiscated buildings which had belonged to the church, emigrants, etc. The opprobrious name was fixed on them on account of their vandalism in the destruction of old relics, works of art, churches, convents, abbeys, episcopal residences, etc. It has, however, been alleged, that their minute subdivision into lots of the old territorial domains has benefited agriculture and ameliorated the condition of the people.

BANDEROLE, n. *bān'de-rōl*, or **BAND'ROL**, *bānd'rol*, or **BAN'NEROL** [F. *banderole*, a little flag or streamer—from Sp. *bandernola*]: a small streamer fixed immediately under the crook, on the top of the staff of a bishop's crosier (q.v.), and folding over the staff. In the *army*, the little flag attached to a trumpet.—Also in *arch.*, the flat inscribed band used in the Renaissance buildings, similar to those now used for mottoes to coats-of-arms.



BAND-FISH, or **SNAKE-FISH** (*Cepola*): genus of fishes of the Ribbon-fish (q.v.) family. The body is much elongated and compressed. The bones are little more solid than a mere fibrous net-work, and everything else exhibits a corresponding delicacy, so that specimens are seldom obtained uninjured. All the species inhabit quiet depths, and are incapable of contending with waves and currents. Their singular form, and the beauty of their colors, make them objects of great interest. One species, the Red B. (*C. rubescens*), common in the Mediterranean, is occasionally cast ashore by storms on the British coasts. It is about 15 inches long. Its brilliant appearance, when moving in the water, has suggested the names of Fire-flame and Red Ribbon, by which it is known at Nice.

BANDICOOT, *bān'dī-kōt* (*Perameles*): genus of marsupial (q.v.) quadrupeds, occupying in the zoology of Australia a place analogous to that of shrews (q.v.) and hedgehogs (q.v.) in Europe. Their dentition is remarkable, as they have ten cutting teeth in the upper jaw, and only six in the lower, the posterior ones of which are two-lobed: in other respects, it nearly resembles that of opossums. They have an elongated head and pointed muzzle; the hind-

BANDICOOT—BANDIERA.

legs are considerably longer than the fore-legs; the thumb and little toe of the fore-feet are little more than simple tubercles, so that there seem to be only three toes; and there is a fleshy tubercle in place of a thumb on the hind-feet. Their movements are similar to those of hares or rabbits. They live on bulbs, insects, etc., make ravages in potato-fields, and devour corn in granaries. There are



Bandicoot.

several species. The Long-nosed B. (*P. nasuta*) is about a foot and a half in length from the extremity of the nose to the origin of the tail, which is not unlike that of a large rat, but better covered with hair. It is chiefly found in the mountainous parts of New South Wales. *P. Gunnii* is common in Van Diemen's Land.

BANDICOOT, n. *băn'dĩ-kôt* [*bandikut*, the native name], or BAN'DICOOT RAT, MALABAR' RAT, or PIG-RAT (*Mus gigantens*): the largest known species of rat. The name B. is a corruption of the Telinga *pandikoku*, literally signifying pig-rat. The animal inhabits many parts of India, and is plentiful in Ceylon. It is found chiefly in dry situations, and often in hilly districts. It attains the weight of two or three pounds, and is 24-30 inches long, including the tail, which at the base is 2½ inches in circumference. The body is thick, and greatly arched, black above, grayish below. Its flesh is a favorite article of food with the coolies of India, and is said to be delicate, and much to resemble young pork. It feeds chiefly on grain and roots, and is very destructive in gardens. 'Its nests, when rifled, are frequently found to contain considerable quantities of rice, stored up against the dry season.'—Sir J. E. Tennent's *Ceylon*.

BANDIERA, *băn-de-ũ'râ*, ATTILIO and EMILIO: two brothers, descended from a distinguished family of Venice: lieutenants in the Austrian navy, in which their father was rear-admiral. In the year 1842, inspired with an enthusiasm for the freedom and unity of Italy, they entered into correspondence with Mazzini, whom they regarded as almost a demigod. Unfortunately they became impressed with the delusive idea that their native country could be saved by means of a conspiracy. Misled by false rumors of a rising in Naples, coming, it is thought, from the Neapolitan police,

BANDINELLI—BANDIT.

they ventured to land with twenty companions at the mouth of the small river Nieto, in Calabria, believing that their appearance would be the signal for a general insurrection. The Neapolitan government expected them; and they were taken prisoners at once. Nothing ever transpired respecting the trial of these unfortunate men. Attilio and Emilio were shot with seven of their comrades in the public square of Cosenza, 1844, July 25. They died, exclaiming 'Viva l'Italia!' The fate of the brothers B. attracted much attention in England, from the fact that letters of M. Mazzini, then in London, had been opened in the post-office by authority of government, which was accused of giving such information to the Italian governments as enabled them to entrap the insurgents.

BANDINELLI, *bân-de-něl'ē*, BACCIO: 1487–1559 (or 60); b. and d. Florence; son of a famous goldsmith; one of the best sculptors of his time; pupil of Rustici, friend of Leonardo da Vinci. He is said to have been an angry and jealous rival of Michael Angelo, whose grandeur of conception he strove to equal, and who is said to have retaliated by contempt. All information of him, however, is from prejudiced sources. Benvenuto Cellini, whose language is generally passionate and hyperbolical, is his chief accuser, although Vasari also speaks of his proud and envious disposition. It is impossible to deny that, as a sculptor, he was in his day second only to Michael Angelo. He was patronized by Cosmo de' Medici, Charles V., Francis I., Clement VII., and other powerful friends. Clement even bestowed on him an estate.

His best works are bassi-rilievi, among which are those that adorn the choir of the Duomo at Florence. On the high-altar in the same building is to be seen his Corpse of Christ, supported by an angel, with God the Father over it. His most ambitious work is Hercules with Cacus at his feet. In the Medicean Gallery are his copies of the group of the Laocoon—a masterly imitation of the antique, in which he boasted that he excelled even the ancients themselves. He also executed statues of some of his patrons; all his works exhibit power, vigor, and skilful drawing, but it is alleged, apparently with truth, that 'he was too fond of the terrible graces of composition.'

BANDIT, n. *bân'dīt*, BANDITTI, n. plu. *bân-dīt'ē*, or BAN'DITS, n. plu. [It. *bandito*, one proclaimed or denounced—from It. and mid. L. *bandirē*, to proclaim, to denounce—from mid L. *banum*, a proclamation]: originally signifying a 'banished' or outlawed person; then one who, because outlawed, wages war against civilized society; and finally a highway robber. The banditi, or banditti, formed in Italy in earlier times, as it were, a separate community or guild, who submitted to their own stringent laws, carried on both open and secret war with civilized society, and kept up a certain romantic idea of honor. By means of severe measures against them and their abettors, adopted 1820 by the papal government, their haunts were broken up. Those who still occasionally disquiet the frontiers of

BAN-DOG—BANDON.

Naples are in general people settled on the spot, who regard robbery and murder as equally a branch of their trade with agriculture. Peter the Calabrian, one of the most famous B. chiefs in 1812, assumed the titles of 'Emperor of the Mountains, King of the Woods, and Lord of the Highroads from Florence to Naples.' The government of Ferdinand I. found themselves obliged to conclude treaties with him. The banditti must be distinguished from common robbers, called *Malviventi*. In later times the banditti were joined by adventurers of all kinds, to such an extent that the Austrian troops who occupied Naples were obliged to make frequent expeditions against them. In Sicily the banditti are most numerous in the Val Demone. They formerly had so much power there, that the Prince of Villafranca, as a piece of policy, declared himself their patron, and treated them with much confidence. In 1841-43, political fugitives united with robbers and adventurers of all kinds in the Abruzzi, Calabria, and Romagna, and since then they have never been entirely extirpated. The revolutions of 1848,9 added greatly to their numbers, and in several districts of Italy, especially in the States of the Church. between Ferrara and Ancona, they reached an unheard-of degree of boldness, notwithstanding the Austrian army of occupation. Under the command of one Bellino (known by the name of 'Il Passatore'), a man of daring and ability (d. 1851, March), they kept the country in terror, and even burned several villages. They also carried on a real guerilla warfare against the military forces of the country. Recent events in Italy have it is said, recalled numbers of these banditti to a more honorable life. See CAMORRA. In Greece, organized banditti still make travel in some parts perilous.

BAN-DOG, n. *băn-* [properly *band-dog*, one requiring to be held in leash or tied up]: a kind of large dog; a mastiff.

BANDOLINE, n. *băn'dō lîn* [a probable compound of Eng. *band* and *line*: L. *oleūm*, oil, or in the sense of a stiffener]: a mucilaginous preparation for stiffening the hair. The usual recipe for making B. is to boil Carrageen (q.v.) or Irish-moss with water till a thick mucilage is obtained, which is afterwards scented with *Eau de Cologne* or other perfumed spirit; a second process is to soak quince-seeds in cold water for a day or two, then strain, and add perfume; a third process is to heat gum tragacanth with water, and when a mucilage is obtained, add the scent.

BANDON, *băn'don*, or BAN'DONBRIDGE: town of the county of Cork, Ireland; on the Bandon, 12 m. s.w. from Cork, with which it is connected by a railway. The houses are of stone. There are several good streets, and numerous ecclesiastical and other public buildings. B. was originally peopled by a colony of English Protestants, and was so strictly Protestant, that till about the beginning of the present century, no Roman Catholic would have been allowed to settle in it. More than three-fourths of the population are now Rom. Cath., and there is a convent.

BANDONG—BANFF.

B. was at one time a prosperous manufacturing town, cotton-spinning and weaving being extensively carried on; but these branches of industry have been almost entirely relinquished. It returns one member to the house of commons. The country around B. is very beautiful, well wooded, undulating, and pastoral. Pop. (1871) 6,131; (1881) 5,949; (1891) 6,074.

The river Bandon rises in the Carberry mountains, and at its mouth forms the harbor of Kinsale. Spenser describes it as 'the pleasant Bandon, crowned by many a wood.' It has a course of 40 m., for 15 of which it is navigable, to Innishannon, four m. below Bandon.

BANDONG': commercial town on the w. coast of Java, in the vicinity of the volcano Gunong Guntour, by an eruption of which 80 villages were destroyed in 1822.

BANDORE, n. *băn'dôr* [Sp. *bandurria*—from Gr. *pan-doura*, a musical instrument with three strings]: a stringed musical instrument like a lute.

BANDY, v. *băn'dĩ* [F. *bander*, to bind, to drive the ball from side to side at tennis—from Sp. *banda*, a side]: to beat to and fro, as a ball in play; to exchange; to retort in words; to give by turns; to contend: N. a bent club for striking a ball at play. BAN'DYING, imp. BANDIED, pp. *băn'did*. BAN'DIER, n. *-dĩ-ér*, one who.

BANDY-LEGS, n. plu. *băn'dĩ-lěgz* [OF *bander*, to bend; *bandé*, bent, as a bow by binding it with a band]: bent or bowed legs.

BANE, n. *băn* [AS. *bana*, murderer: Icel. *bana*, to slay; *baní*, death: OH. Ger. *bana*, death-blow]: a poison of a deadly quality; any fatal cause of mischief. BANEFUL, a. *băn'fũl*, poisonous; pernicious. BANEFULLY, ad. *-lĩ*. BANEFULNESS, n. the quality of being poisonous. BANEWORT, n. *băn'wěrt*, deadly nightshade. BANEBERRY, the wild poisonous plant, *Actæa spicātũ*, ord. *Ranunculacęæ*, having a single succulent carpel, containing many ovules.—SYN. of 'bane': ruin; destruction; mischief; pest; injury; poison.

BANE'BERRY: see ACTÆA.

BANFF, *bămf*: capital of Banffshire, Scot.; a seaport in the n. of the county, on the left bank of the mouth of the Doveran, 45 m. by road, and 50 by rail, n.n.w. of Aberdeen. It has a higher or inland town, and a lower or sea town, on the Moray Firth. On a height between the towns are some remains of a royal castle, on the site of which is now a large house—the 'Castle.' To the e. of B. is Duff House, the seat of the earl of Fife, with a large park. The harbor is liable to be shoaled by sand. A seven-arched bridge over the Doveran unites B. with the seaport of Macduff, half a mile e., whose shipping trade is more extensive than that of B. The chief exports are corn, cattle, salmon, and herrings. Robert II., 1372, made B. a royal burgh. Abp. Sharp of St. Andrews was born here, 1613. Great destruction was wrought by a flood of the Doveran, 1829.

BANFFSHIRE.

Pop. in B. (1871) 7,439; (1881) 7,871; in Macduff (1871) 3,407; (1881) 3,650; (1891) Banff, 3,876; Macduff, 3,722.

BANFFSHIRE, *bām'f'shēr*: county in the n.e. of Scotland, bounded n. by the Moray Firth; e., s.e., and s. by Aberdeenshire; w. by Elgin and Inverness shires; thirteenth among the Scotch counties in size, fourteenth in population. Its greatest length is abt. 59 m., its greatest breadth abt. 32—average 12; its extent of sea-coast abt. 31; estimated area, 646 sq. m. The surface, especially in the s. and s.e., is mountainous, interspersed with fertile valleys and fine pastures; but the surface near the coast is comparatively level. The chief mountain-ranges, rivers, and strike of the stratified rocks run from s.w. to n.e., and the whole county is an extensive slope in the same direction, from the Grampians to the Moray Firth, into which the rivers flow. The coast is rocky, but not high, except to the e. of Banff. The highest peaks are the North Cairngorm, 4,084 ft.; Ben-a-main, 3,874; Ben Rinnes, 2,755; Corryhabbie, 2,569; Knock, 1,409. Ben Macdhui, 4,296 ft., is partly in Banffshire. The chief rivers are the Spey, which bounds a third of the county on the w.; and the Doveran, 60 m. long, mostly within the county. Predominant rocks are granite, quartz rock, mica-slate, clay-slate, syenitic greenstone, graywacke, graywacke-slate, old red sandstone with fossil fishes, metamorphic limestone, and serpentine. The serpentine near Portsoy has long been famous as the 'Portsoy Marble.' Beryl and rock-crystal occur on Cairngorm. Lead, iron, antimony, and plumbago occur in small quantity. The soil in many parts is very fertile, and highly cultivated. In 1878, a third of the surface of B. was in crop, the chief crops being oats, turnips, and grass. The breeding of cattle is the chief object of the farmer. In 1881, B. had 8,074 horses, 41,952 cattle, 50,733 sheep, and 2,954 pigs. The chief manufactures of B. are weaving, bleaching, tanning, distilling, and artificial manures. Glenlivet whisky has long been celebrated. Chief exports are grain, meal, and cattle. There are twelve fishing towns and villages along the coast. Herring-fishery is extensively carried on. The salmon-fisheries of the Spey and Doveran are very valuable, the Spey ranking after the Tweed and Tay as a salmon-river. B. is divided into the districts of Enzie, Boyne, Strathisla, Strathdoveran, Balveny, Glenlivet, and Strathavon. Chief towns and villages are Banff, Macduff, Portsoy, Keith, Cullen, Buckie, Dufftown, and Tomantoul. There are 23 civil parishes in the county, and 81 places of worship (of which 33 belong to the Established church, and 24 to the Free church). Valued rental of B. (1885,6), £229,427. The parliamentary constituency in 1885,6 was 7,018. B. with the counties of Aberdeen and Elgin, enjoys the Dick bequest (q.v.) for parochial education. Two-thirds of B. belong to four landed proprietors. The county returns one member to parliament, and Banff and Cullen unite with Elgin, Inverury, Kintore, and Peterhead in returning another. B. contains numerous remains of antiquity, the most remarkable being the old churches of Gamrie and Mortlach. The

BANG—BANGKOK.

former, built 1010, and used for public worship till 1830, is called the 'Kirk of Skulls,' the bones of the Norsemen who fell on the neighboring field of Bloody Pots having been built into its walls. Mortlach was for a century the seat of a bishop, but David I., 1139, incorporated the see with that of Aberdeen. Pop. of B. (1871) 62,023; 84.79 per cent. of the children between the ages of 5 and 13 were receiving education. Pop. (1881) 62,736; (1891) 64,167.

BANG, *v.* *bǎng* [Sw. and Icel. *bang*, a hammering, stir, tumult. Goth: *banja*, a blow, a bane; imitative of the sound of a blow]: to treat or handle roughly; to shut with a loud noise, as a door: N. a heavy blow; the thump or sound of a stroke. BANG'ING, *imp.* BANGED, *pp.* *bǎngd.*

BANG, or BENG, *n.* *bǎng* or *běng*: an intoxicating Turkish drug. See BANGUE.

BANGALORE, *bǎn-ga-lōr'*: fortified town of Mysore, in the dist. of Bangalore, 216 m. w. of Madras; terminus of the Mysore branch of the Madras railway. When Mysore was occupied by Britain, 1831, B. was made the administrative capital of the state. (Mysore was restored to native rule 1881.) B. has manufactures of silk, cotton, and carpets; also of gold, silver, lace, electro-plate, and leather. Trade is brisk and the markets lively. At B., which is 3,000 ft. above the sea, the thermometer rose only twice above 90° in six years. B. was a favorite residence of Hyder Ali; and, 1791, it was stormed by the British under Lord Cornwallis. Pop. (1891) 180,366, of whom abt. 15 per cent. are Mohammedans.—The Mysore district of B. has an area of 2,901 sq. m., and a pop. of (1881) 669,139.

BANGIA, *n.* *bǎng'ī-a* [after Christian Frederick Bang]: genus of *algæ*. The species are in broad and silky tufts.

BANGKOK, *bǎn-kōk'*: cap. of Siam; on the banks of the Meinam, about 20 m. from its mouth, in the Gulf of Siam: lat. 13° 38' n., long. 100° 34' e. About half the people are Chinese, in whose hands is centred nearly all the trade of B., which is large. The exports of B. (in fact those of all Siam) had, 1891, a value of near \$8,500,000; and the imports \$7,200,000. In 1879 they were rather larger. For their right to trade here, the Chinese pay a poll-tax of about three dollars on entering the kingdom, and a similar sum is collected from them every three years. The payment of this tax exempts them from the half-yearly servitude which all other oriental strangers resident in Siam are required to give. The approach to B. by the Meinam, which can be navigated by ships of 200–300 tons, is exceedingly beautiful, the banks being skirted by fine trees full of gay birds. As the town is neared, numerous temples present themselves, and floating houses are frequent; and finally, the whole city with its rich gardens, and shining temples and palaces, bursts full upon the view. A large number of the houses float on rafts, and can be transferred from one place to another. There are a few houses in the city built of brick and stone, but the greater part are of wood. There are usually in each house a division for males and one for females. The land-houses are raised upon piles, 6 or 8 ft.

BANGLES—BANGOR.

from the ground, and are reached by rude ladders—the daily flow of the tides and the annual inundations rendering this plan necessary. The floating-houses are made of bamboo-boards, wicker-work, or palm-leaves, and have generally a veranda in front, with a small wing at each end. The circumference of the walls of B., which are 15 ft. high and 12 broad, is said to be 6 m. The internal traffic is carried on chiefly by means of canals, there being only a few passable streets. Horses and carriages are rarely seen except in the neighborhood of the palaces. The chief interest of the kingdom of Siam, according to Sir John Bowring, concentrates itself in Bangkok. B. is the constant residence of the two kings of Siam and their respective courts. The palace of the first king is surrounded by high walls, and is nearly a mile in circumference. It includes temples, public offices, accommodation for some thousands of soldiers, with their necessary equipments, a theatre, and rooms for about 3,000 women, 600 of whom are the wives of the king. The sacred white elephant has also a place within the palace. Throughout the interior are distributed the most costly articles in gold, silver, and precious stones. The palace of the second king, whose functions are not very clearly defined, is nearly as large as that of the first king, but not so ostentatious. See SIAM. The temples of B. are innumerable, and decorated in the most gorgeous style, the Siamese taking a pride in lavishing their wealth on them. Some of them, according to the Catholic bishop Pallegoix, have cost more than 4,000,000 francs (\$800,000). In the neighborhood of B. are iron-mines and forests of teak. Chief exports are sugar, pepper, cardamoms, ivory, feathers, hides, fine woods, rice, salt, and fish. By the treaty concluded by Sir John Bowring, 1855, the Siamese reserve the right to prohibit the exportation of salt, rice, and fish, in cases of threatened scarcity. The imports are tea, manufactured silks, and piece-goods, opium, hardware, machinery, and glass wares. In 1894, 516 vessels of 414,583 tons cleared the port. Pop. abt. 500,000. See Sir John Bowring's *Siam*.

BANGLES, n. *băng'glz*, ornaments worn on the arms and ankles in India and Africa. BAN'GLE-EAR, a loose hanging ear; a defective ear in a horse.

BANGOR, *băn'gawr*: city and port of entry, cap. of Penobscot co., Me.; on the w. side of the Penobscot river at the head of navigation, 60 m. from the sea, 246 m. from Boston, 136 m. n.e. from Portland by the Maine Central R. R. It is one of the principal cities in Maine, being built on the site of what was Fort Norumbega, erected 1658 by the French. There is a tradition alluded to in Burton's *Anatomy of Melancholy* and Milton's *Paradise Lost*, that there was once a great city of that name situated on this spot. Under the English government, in 1769, the place was called Kenduskeag. It eventually received its present name from a well-known psalm-tune which chanced to be a favorite with Seth Noble, minister of the place at the time. B. was incorporated as a city, 1834. Its excellent railroad facilities and its situation on a navigable river, with

BANGOR.

abundant water-power, have made it prominent in manufactures. Besides being a port of entry it is the seat of justice of Penobscot co. B. has a large and accessible harbor, and the rivers Penobscot and Kenduskeag are extensively bridged. One of these bridges, to the town of Brewer, is 1,320 ft. long. There is railway communication between B. and St. John, N.B., 206 miles.

The city has a commanding position, with a charming view of the Penobscot and of an extensive country. The streets are broad and beautifully shaded, and the public and private buildings attractive. B. contains a fine custom house and post-office building, more than 15 churches, nearly 40 public-school buildings, one of the finest opera-houses in New England, Norumbega Hall, a public library, Y. M. C. A. building, board of trade, a widely-known theol. seminary (Congl.), and a conservatory of music. Its industries include the manufacture of iron foundry products, furniture, boots and shoes, carriages and sleighs, planing-mill products, and burnettized goods. The trade of B. is valuable and increasing, principal in importance being the lumber business, which is larger in B. than in any other city in the United States except Chicago and Buffalo. Nearly 3,000 vessels are employed in freighting timber, etc., besides the shipping engaged in foreign commerce and the fisheries. The value of the imports into B. 1902 was \$1,324,397, exports \$4,164,008. Steamboats run between B. and the ports of Portland and Boston. The direct liabilities of B., 1893, Jan. 1, were (including \$500,000 water bonds) \$774,575; contingent liabilities \$1,925,000; sinking fund \$2,323,469; net debt \$376,106; total debt (1901) \$944,969. The assessed valuation (1892) was, real \$8,092,037, personal \$3,670,324, total \$11,762,461; total value (1901) \$15,125,477. In 1893 there were 5 national banks (cap. \$750,000, surplus \$190,000), 2 savings, 2 private and 1 state bank; and 3 daily, 5 weekly, and 1 monthly periodicals. Pop. (1890) 19,009; (1900) 21,850.

BANGOR, *băn'gér*: an episcopal city, borough, and seaport town, in the n.w. of Caernarvonshire, N. Wales, on the s.e. bank of the Menai Strait, 2½ m. from the Britannia Bridge, and 59½ w. of Chester. It consists chiefly of a narrow crooked street, a mile long, stretching s.w. through a narrow fertile valley bounded on the s. by steep precipices. The grandeur and beauty of the surrounding scenery have long made it a favorite resort, and the opening of the Chester and Holyhead railway, on the great line of communication from London to Dublin, has greatly promoted its prosperity. The town has of late years been much improved, and mostly rebuilt. Its chief trade is derived from the great slate-quarries of Llandegai, 6 m. distant, employing 2,000 men. The slates are exported to all parts of the world, and also manufactured at B. into tables, chimney-pieces, etc. B. unites with Caernarvon, Conway, Criccieth, Nevin, and Pwllheli, in sending one member to parliament. B. is a place of great antiquity. In 525, St. Deiniol founded a college here. It was raised to a bishopric 550, the founder being the first diocesan. The cathedral founded by him

BANGOR—BANIAN.

was destroyed by the Saxons 1071, rebuilt 1102, and again destroyed by fire 1402. The present edifice, built between 1496 and 1532, is a plain embattled cruciform structure, 214 by 60 ft., with a pinnacled tower 60 ft. high. Several Welsh princes and distinguished ecclesiastics are buried here. B. bishopric is the oldest in Wales. B. was chosen 1883 as the site of the University College of N. Wales. Pop. (1881) 9,005; (1891) 9,892.

BANGOR, *ban'gawr*: small seaport town in the n.e. of county Down, Ireland; on the s. side of the entrance to Belfast Lough, 12 m. e.n.e. of Belfast. Steamers ply daily during the summer between B. and Belfast. Cattle and provisions are exported. Lead is found at Conlig in the neighborhood. B. is a favorite watering-place of the middle classes of Belfast. St. Cungall, 555, founded Bangor Abbey ('Ban-choir,' the 'White Choir,' whence the name Bangor). From this abbey, Alfred was said to have selected professors for his University of Oxford. In the 9th c. it had 3,000 inmates. Pop. of B. (1881) 3,006 (1891) 3,834.

BANGORIAN CONTROVERSY: a long debate concerning the constitution of the church, excited by a sermon preached by Dr. Benjamin Hoadley, Bp. of Bangor, before George I., 1717, March 31. The sermon was attacked by the advocates of ecclesiastical authority. See HOADLEY, BENJAMIN.

BAN'GOR-ISCOED' [Bangor below the Wood]: inland village, beautifully situated, in a fertile and richly wooded country, on the right bank of the Dee, on the borders of Flintshire and Denbighshire, N. Wales, 5 m. s.e. of Wrexham. It was anciently the seat of one of the largest monasteries in Britain, founded before A.D. 180, and containing 2,400 monks in the time of St. Augustine. Pop. of township abt. 600.

BANGRA, n. [Mahratta, *bhang*, hemp]: coarse hempen cloth made in north India.

BANGUE, BANG, or BHANG, n. *bǎng* [Sks. *bhangga*, hemp: F. and Sp. *bangue*]: the prepared leaf of Indian hemp, used as a stimulant in the East. See HEMP, INDIAN.

BANGWEOLO, *bǎng-wē-ō'lō*, called also BEMBA, *bēm'bâ*: a great central African lake, discovered by Livingstone 1868; 150 m. long, 75 wide; 3,700 ft. above the sea. The Chambeze, which flows into it, and the Luapula, which issues from it, constitute the head-stream of the Congo. The shores are flat, and parts of the lake are mere marsh. On its s. shore Livingstone died.

BANIALUKA, *bân-yâ-lô'kâ*: fortified town of Bosnia; on the Verbas, with numerous bazaars and warm baths. Pop. 10,000.

BANIAN, or BANNIAN, *bǎn'yân*, or *bǎn-yan'*, [Skr. *banij*, a merchant]: a word used in India to designate a merchant or trader generally. It is more particularly applied to the great merchants in the w. of India, especially in the seaport towns of Bombay, Surat, Cambay, etc., who carry on a very extensive trade by caravans with the in-

BANIAN DAYS—BANISTERIA.

terior of Asia, even to the borders of Russia and China, Contrary to the general custom of the Indian people, these Hindu merchants travel much, and the establishments and counting-houses of Indian Banians are to be found in almost every commercial town of any note in Asia. The Banians form a class or division of the caste (q.v.) of the Vaisya, adopt a peculiar costume, are believers in the transmigration of souls, and are strict in the observance of fasts and in abstaining from the use of flesh.

BAN'IAN DAYS: sailor's phrase, nearly equivalent to the *jours maigres* of the French, denoting the days in which, by a custom in the British navy no longer observed, no meat was served out to a ship's crew. The term was derived from the Hindu Banians, who were vegetarians.

BAN'IAN-TREE: see **BANYAN**.

BANIM, *bā'nīm*, **JOHN**; 1800-42, Aug. 1: celebrated Irish novelist. He showed vigorous grasp and vivid fancy, in a series of pictures of life, delineating the peculiarities of the Irish character. B. dwells too much on the horrible; his descriptions are sometimes tiresome in minuteness; his imitation of Scott is frequently palpable. He failed in portraying the manners and frivolities of the higher classes; but he succeeded above all others in depicting the Irish peasant, with his picturesque peculiarities, in his sufferings and his errors. His *Tales of the O'Hara Family* (London 1825) were followed, 1826, by a second series, of which several were translated into German by Lindan. Next appeared *The Battle of the Boyne*, *The Droppy* (1828), *The Denounced* (1830), *The Smuggler* (1831), *The Mayor of Windgap*, *Father Connell*, etc. In 1837, general sympathy having been attracted towards B.'s privations, occasioned by disease that precluded all literary exertion, a pension of £150 per annum from the civil list was awarded him by government, which was afterwards further increased by £40 for the education of his daughter, an only child. He died in poverty at Windgap Cottage, near Kilkenny.

BANISH, v. *bān'ish* [F. *bannir*, to banish; *bannissant*, banishing—from mid. L. *bannirē*, to proclaim; to denounce (see **BAN** and **BANDIT**): to proclaim under the ban; to condemn to exile; to compel to leave a country; to send as a prisoner to a colony. **BAN'ISHING**, imp. **BANISHED**, pp. *bān'isht*. **BAN'ISHMENT**, n. the state of being sent out of a country as a criminal; a driving away; formerly a penalty in English and Scotch law, now no longer known except in the sense of transportation (q.v.): see also **PENAL SERVITUDE**. —**SYN.** of 'banish': to exile; expel; transport.

BANISTER, n. *bān'is-tēr*: corrupted from **BALUSTER**, which see.

BANISTERIA, n. *bān-is-tēr'ī-a* [after *John Banister*, who lost his life searching for plants in Virginia]: genus of plants belonging to order *Malpighiaceæ*, and tribe *Banistereæ*. The species are evergreen twiners and climbers, with fine leaves and flowers; natives of America.

BANJERMASSIN—BANJOEMAS.

BANJERMASSIN, *bân-jêr-mâs'in*: a large kingdom on the s.e. of Borneo; 5,880 sq. m. Since 1860, it is governed by the Dutch Resident for the s. and e. of Borneo, who has an assistant at Martapura, where the sultans formerly lived. B. is watered by large rivers and intersected by a chain of mountains, in several parts rising to 3,000 ft. Excellent small arms are manufactured. The products are pepper, wax, edible nests, rattans, benzoin, dragons' blood, coal, iron, diamonds, and gold dust. Pop. of the kingdom, abt. 150,000, chiefly Mohammedans.

B., capital of the residency, is built on the island Tatas, about 12 m. from the mouth of the Banjermassin or Barito; pop. 35,000. The population of the residency numbers abt. 350 Europeans and 900,000 natives. There is a considerable trade in native products and the imports are piece-goods, gunpowder, rice, sugar, Chinese porcelain, silks, and a few horses from Java.

BANJO, n. *bân'jō* [corruption of BANDORE, which see]: a favorite musical instrument of the negroes, having five strings, a head and neck like the guitar, and a body of a tambourine shape, played with the fingers and hands.

BANJOEMAS, *bân-yô-mâs'*: town of Java, 22 m. from the s. coast; s. lat. $7^{\circ} 33' 45''$, e. long. $109^{\circ} 19' 20''$. It is at the opening of an extensive and fruitful valley on the left bank of the Serajo. It is well built, and carries on a considerable trade. Pop. 9,000. B. is the residence of the Dutch governor, and has a fort and garrison. It is capital of a province of the same name, which produces coffee, sugar, indigo, rice, tobacco, etc. Pop. of town. 9,000.

BANK—BANKING.

BANK, n. *bǎngk* [F. *banc*; Ger. *bank*, a bench, a bank: It. *banco*, a bench, a merchant's place of business]: a mound or ridge on earth; any steep ascent; a heap of anything; a place where a collection of money is deposited; the margin of a river or the sea: V. to raise up a mound of earth or a dike to inclose; to deposit money in a bank. **BANK'ING**, imp.: **ADJ.** pertaining to a bank. **BANKED**, pp. *bǎngkt*. **BANK'ER**, n. one who deals in money or whose business is banking; a stone bench on which masons place the block of stone on which they are operating; a bench used in brick-laying for preparing the bricks for gauged work. **BANK'ING**, n. the business or employment of a bank for money: **ADJ.** of or relating to the business of banking. **BANK'ABLE**, a. *-ǎ-bl*, receivable at a bank. **BANK-BILLS**, promissory notes or bills of exchange issued by a bank. **BANK-BOOK**, a book in which the cashier or clerk enters the debt or credit of a customer. **BANK-NOTES**, engraved pictorial forms, on specially prepared paper, and duly signed by the bank authorities, representing various values up from one to five pounds, to a thousand or more, made payable on demand in gold. **BANK-STOCK**, shares in the trading capital of a bank. **BANKERS' CLEARING-HOUSE**: see under **CLEAR**. **BANK'ET** [F. *banquette*]: wooden bench on which bricks are cut.

BANK—BANKING: an establishment for receiving on deposit, issuing, lending, changing, or transmitting money—the business of dealing in money. A banker lends money at interest, usually for short periods on satisfactory security, and receives money on deposit, for which he sometimes allows interest, and sometimes without interest merely keeps it safely for the depositor. Some banks—notably the Bank of Amsterdam, which, during the 17th c., was the great warehouse for bullion in Europe—were simply custodians of coin and bullion lodged with them, for which they granted receipts transferable from hand to hand, entitling the owners to get back the gold or silver, in coin or bullion as originally deposited. But money lying in such banks was unproductive, and indeed entailed upon the owners considerable charges to pay the necessary expenses of management. In recent times the competition for money by borrowers has become so keen, and the outlets for lending it safely so numerous, that banks of this class exist no longer, and the business of receiving money is now universally combined with that of lending it out. A banker does not hoard all the money deposited with him; he gives out the greater portion on loan. The advantages accruing to society from the operations of banking are thus immensely increased. A banker receives from all around him the sums of money, both small and great, which would otherwise be useless in the coffers of the owners, and lends it to those who can employ it to advantage and could not otherwise obtain it. The direct advantages arising from such transactions are considerable. The banker, if the money is allowed to lie with him for some time, will pay the depositor interest upon it, will lend the amount to a borrower who will engage in

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some business transaction with it and make a profit thereby; and the banker himself will make a profit upon the difference between the interest allowed to the depositor and charged to the borrower. But the indirect advantages are not less important. With the money thus lent out, manufacturers can purchase raw material to be worked up, and procure food and clothing for their workmen; and traders can go into the markets and purchase commodities for resale. Commodities are thus more quickly turned to useful purposes, and a stimulus is given to the production of more. But a banker deals with the money not only of others; he uses money belonging to himself. This is his *capital*. Few would be found to deposit their money with a person known to possess none of his own. If he lend deposits to those who fail to repay them—that is, if he *make bad debts*—he has the means from his capital of replacing the deposits thus lost.

The services that a banker performs as the cash-keeper of his depositors are very great. In the case of persons not themselves in business, it is quite usual for a banker to make all their money-payments, beyond their small daily expenditure, and to receive the money payable to them. The money transactions of such persons are thus contained in their banker's books. This is effected by the depositor giving a check or order on his banker for the sums that he has to pay; and by handing to him all the *checks* or orders the depositor receives for sums payable to himself. Suppose a person's income derived from dividends on government stock; he sends a *power of attorney* or authority to his banker to take up the dividends for him. These are received by the banker as deposits, and are drawn out by the depositor as occasion occurs, by checks issued by the depositor to those to whom he requires to pay it away. So he may receive money due to him by a check given to him by his debtor. This check he sends to his banker, who will obtain payment. If both persons deal with the same banker, a simple transfer in his books will carry through the transaction; and if the bankers be different, and each has received, in the course of his business, as is alwas happening, a check on the other, there will be a set-off between them; and two payments will be made as well as two deposits, without trouble to the persons concerned, and without the employment of any money. But this mode of managing pecuniary transactions is not confined to those not engaged in business; it is followed on a scale out of all proportion greater in carrying through the money transactions of those in business or trade in the principal industrial countries.

Besides thus performing the function of cashiers to their depositors, in consideration of the profit made on their deposits many banks allow their depositors interest on their deposits. The rate allowed is, of course, always less than that received by the banker. Frequently a depositor bargains with the banker not to draw out his deposit without previous notice, longer or shorter as may be agreed on, and in this case the banker will allow a higher rate of in

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terest than when the deposit is repayable *on call*—that is, at any time without previous notice. The practice of allowing interest on deposits has prevailed in Scotland since 1729, but in England is of later growth, and not invariable; the English rule being rather to allow interest on fixed deposits only, and to allow no interest on money at call or on current accounts. It has led, of late years, to a great increase in the amount of deposits. Many persons prefer the low rate of interest which banks give, to the higher rate which may be obtained from individual borrowers, or to the greater return which may be received if they traded on their money.

Occasions are always occurring for withdrawing deposits, as well as making them. Traders and commercial men, for example, day by day, deposit with their bankers the drawings or sums of money which they receive in the course of their business: and, on the other hand, day by day, draw out such sums as they require to pay away in purchases of goods, in wages, rent, and other expenditure. A bank, therefore, while continually receiving deposits is continually repaying deposits; and the amount uncalled for is subject to daily fluctuation. At one period of the year, or in a certain condition of trade, the amount of deposits may be high; at another, low. As it is a principle at the very root of banking, that money deposited shall be returned, either on demand, or punctually at the expiry of a stipulated notice, it follows that banks must always have in their coffers as much of the money deposited with them as there is the least likelihood of being called for by depositors. When business is in its ordinary condition, a bank can, after some experience, approximate closely to the amount of the greatest demand for a return of deposits throughout the year, and provide accordingly. But sometimes the credit of a bank becomes doubted, either from causes peculiar to itself, or on occasions of a *panic* or general distrust, when all who own money wish to have it in their own possession. In these cases, there is a *run* on the bank for repayment of its deposits, and the amount called for may be far beyond the maximum demanded in ordinary times. If the bank has not retained as much of the deposits in its coffers as meet the demand, it is said to *suspend payment*, and, as a general rule, it must wind-up its business; the confidence of the public that it will in future restore its deposits on demand being now destroyed. There are two prime rules in safe banking: the one is, that the bank shall lend its deposits only on undoubted and readily negotiable securities, however low the profit; and the other is, that the bank shall retain a sufficient amount of its resources—and this is called the *reserve*—to meet the possible demands of the depositors, even in cases of a run, although there may be no reason to expect one; for when a run comes, it seldom casts its shadow before. But it is evident that the greater the *reserve* of a bank, the less the amount of deposits which it can lend out and draw interest for; hence the temptation which banks lie under of imprudently lending out a too great proportion of their deposits—thus precipitating failure.

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The *reserve* of the banking department of the Bank of England is always in coin, or, what is the same thing, in notes against which there is coin lying in what is called the *issue* department of the bank. In the case of all other banks in Britain, the reserve is only partly in coin; sometimes the proportion of coin is very small. A great portion of the reserve is generally in Bank of England notes, equivalent, of course, to coin. These other banks also hold a portion of their reserve, in the shape of government stock, in which they have invested it. In this way, the banks obtain a return on this last portion of their reserve, in the dividends or interest paid by government on the stock—this return being less, indeed, in the usual case, than if the bank had lent out the money in the ordinary course of business, but better than no return at all, as must be when the coin or notes are lying idle. The reason why government stock, in Great Britain, is a safe reserve is, that it is sure to command a purchaser at all times. If there be a run on a bank, it immediately finds a purchaser for the stock, and with the price, whether paid in gold, or in Bank of England notes, the only other legal tender, it meets the demands of its depositors. Sometimes a bank has its reserve in the form of a deposit at the Bank of England; or, if a provincial bank, with some London bank which has its own reserve there. From the Bank of England being the channel through which, directly or indirectly, payments are made, and moneys received, by other banks, it is more convenient for them to have their reserve lying as a deposit in it, than lying as gold within their own walls. In the case of a demand on their reserve, the banks will draw out their deposits, in notes, or, if gold be in demand, in gold, from the Bank of England. Whether, therefore, the reserve of a bank is invested in government securities, or is deposited in the Bank of England, or is in Bank of England notes, it is from the coin in that bank that the gold comes in the case of a run. It is apparent from this that it is essential to the stability of all banks in that country, so long as they themselves do not keep a sufficient reserve of coin in their coffers, that the Bank of England shall always be possessed of coin, and never be unable, on demand, to pay its depositors in gold, or to give gold in exchange for all its notes that may be presented to it. It may be added, that while banks gain, through the annual dividends, in keeping their reserve in government stock, they run the risk of a loss in the event of their requiring to sell it in the time of a panic. For at such a time, when many securities and stocks become unsalable, and all of them suffer depreciation in value, government stock itself falls in price, although less so than the others. Banks often invest portions of their reserve in other stocks than government stock. The higher return obtained on these other is, however, outweighed by the greater risk of depreciation in their value, whether continued unsold or thrown into the market for sale in times of panic.

We have hitherto been treating banks as banks of *deposit*

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and *loan*; but many of these banks, in all countries where banks are known, are also banks of *issue*. Banks of deposit, as has been mentioned, make loans from their capital and deposits. If from capital, the banker has no greater profit by the transaction than if he had lent out his money in any other way, equally safe, and involving the same amount of trouble. If from deposits, the interest which he receives, so far as it exceeds the interest, if any, paid to the depositors, and a ratable proportion of the expense of carrying on the business of the bank, is pure gain to him. But a banker may give the loan from his own notes, and in that case his gain is still greater. A bank-note is simply a written promise by the bank issuing it, to pay to the bearer, on demand, a sum of money—that is, in coin of the realm. Of course, the borrower would not accept a loan from a bank in its own notes, unless he believed that it could redeem its promise of paying in coin, and that the public were of the same opinion; for the moment that a suspicion arises that the promise will not be made good, the note will cease to pass from hand to hand as coin, or to perform all the functions which coin performs. But when the loan is accepted in a bank's own notes, it is evident that the interest which the bank draws for the loan of its promises to pay is pure profit, except the ratable proportion—as in the other cases—of the expense of carrying on its business, and the expense of the paper and printing of the notes with the government stamp-duty. In other words, a bank which can get people to pay to it interest for the loan of its promises to pay, draws the same income—barring the comparatively trifling expense of manufacturing the written promises—as a bank does which has to provide itself with gold for making its loans. The motive which a bank has to extend its issues on loans is therefore apparent, so long, of course, as it is not compulsory on it to retain unemployed in its coffers as much in gold as it issues in notes.

But it does not follow that when a bank makes a loan in its own notes for a definite period, it will really obtain the benefit of the whole of the interest on it for that period; for the borrower does not apply for the notes that he may keep them beside him, but that he may pay them away in making a purchase, or in liquidating a debt, and this, most commonly, on the very day he receives them. If the person to whom the notes are thus paid by the borrower has himself no purchase to pay for, or no payment to make, he may, the moment he gets them, return them to the bank that issued them, to lie there on deposit. If the bank pays interest on deposits, as some banks do, then out of the interest drawn by it on the original loan, it will have to pay interest to the depositor of the notes; in other words, the loan is no longer a loan of its notes, but a loan from its deposits. Or, the person receiving the notes from the borrower may immediately present them to the issuing bank for coin, instead of depositing them. Here, too, therefore, the loan that was made in notes is now converted into a loan of coin, that was in reserve from previous de-

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posits, or that was part of the bank's own capital; in which cases, the bank obtains no advantage whatever in having made the loan originally in its notes. It might equally well, so far as profit is concerned, have originally made it in gold from its reserve of deposits or capital. Notes generally find their way back to the bank that issued them through other banks, into which they have been paid as deposits, or for the liquidation of debts due to them. These banks suffer the loss of profit or interest on the amount of the notes thus received by them so long as they keep them; they therefore immediately present them to the issuing bank for gold, to replenish their own reserves, or to lend out; or, what is the same thing, they present them to the issuing bank for government stock, or other securities bearing interest, and which that bank has had to provide from its capital and deposits.

It will now be apparent that there are two checks which prevent a bank issuing notes to any extent it pleases. In the first place, there must be a demand for its notes by borrowers. It is only to people in good credit, and likely to make a profitable use of them, that a bank will lend its notes, and such people will not take an increase of loans unless trade be increasing, and new opportunities be presenting themselves for profitably employing the notes borrowed. True, banks, when imprudently conducted, or when deceived in the character of their customers, frequently lend their notes to reckless persons, who overtrade with them, and become bankrupt. But banks commit this error, when they do commit it, to a far greater extent by loans of their deposits and capital, than by loans of their notes. In the second place, the immediate return of the notes, chiefly through other banks for gold, or for other portions of the reserve of the issuing bank, is a check to its issuing more notes than it has a reserve to meet. This return of notes through banks is called the *exchange* of notes—the notes issued by a bank being returned to it in exchange for the notes held by it of another bank.

Besides issuing its notes in loans, a bank may issue them in repayment of deposits. In this case, there is the same profit to the bank as in the other case. The bank gets the profit which it makes on the money which was originally deposited or lodged with it, without having to pay interest to the persons who made the deposit or lodgment; the deposit or money lodged having now been repaid in its notes. But here, too, these notes are equally liable to be returned to the issuer as when they are issued on loans.

Of all the notes issued, in whatever way, by banks, a certain amount is not returned to them, but is kept in circulation, being what is required by the necessities of the public for use as money, passing from hand to hand. It is of course on this portion that the banks make their profit; and in consequence of this profit, they are able to afford banking facilities to the public more cheaply than they could otherwise do. The profit is just the interest on the notes in circulation—less the expense of manufacturing the notes, a ratable proportion of the expenses of con-

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ducting the banks, and the loss of interest or profit on an unemployed reserve kept from prudence, or by the requirement of law, to meet a return of notes. This interest is paid by the persons who originally borrowed these notes from the banks, and who have not repaid them; or if the banks have repaid deposits with the notes, the interest is paid by those to whom they lent what was originally these deposits. The amount of the bank-notes in circulation varies at different periods of the year: at term-times and quarter-days, when more payments than usual are made, there is a greater quantity of money required by the public than at other times, and the notes in circulation increase in amount. This addition to the circulation is drawn from the banks by depositors or borrowers. After it has served its purpose, this additional quantity gradually returns to the banks as deposits or in repayment of loans. If the credit of an issuing bank is at any time suspected, the holders of notes will present them for gold, just in the same way as its depositors will call for a return of their deposits; and this risk must be provided against by a corresponding increase of its general reserve, on which, of course, it makes no profit. It has been generally supposed that when issuing banks suspend payments on a run, the run is one on the part of their note-holders; but this is a popular error. In a well-established bank, the amount of its notes in circulation is of little importance compared to its deposits; and though the holders of small sums in notes may be more apt than depositors to take alarm and rush in a panic to the bank for gold for its notes, a small proportion of its depositors suddenly demanding a return of their money in gold, as effectually drains a bank of its reserve, as if its whole circulation were to be at once presented to it for gold.

Banks make their loans chiefly in the form of *discounts*; that is, upon bills of exchange. Commodities in the wholesale market are generally sold on credit. The buyer promises to pay the amount at a certain date to the seller, and his promise is contained in a bill of exchange. The seller transfers it to a bank, which, on the faith of it, advances the amount in loan to him, less *discount* (q.v.), that is, interest of the money till the bill be due. This is called *discounting*. But banks lend on other securities. A holder of government stock, for example, will obtain a loan on the security of his stock; the banker being entitled to sell it, and repay the loan from the price, if the borrower fail to make punctual payment. So also, the holder of stock or shares in any public company, as a railway company, or of a debenture or bond due by such, can, where the company is believed to be in a sound condition, or the security is salable, obtain a loan from a bank. The owners of commodities lying in a public warehouse may obtain a loan on depositing with the bank the *warrants* or certificates of ownership. Loans, too, are occasionally made for short periods on the mere note of hand of the borrower, when the banker is satisfied of the ability of the borrower to repay the money. Where a banker finds the

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security which he has received to be insufficient, and repayment of the loan is not forthcoming, he will, of course, like any other trader, to avoid making a bad debt, take any other security the debtor can give him—such as a manufactory or a mine. Banks have in this way frequently become involved in manufacturing transactions, in their attempts to make more money of the securities than they would have done by an immediate sale of them; they have become manufacturers and miners, and suffered great losses in consequence. And it is not to be supposed that banks always abstain from making loans when the security is known to be doubtful; far from it: banks, like other commercial establishments, are, on many occasions, recklessly managed. In trying to push business, they may make loans on insufficient security, and banks are under strong temptation, to which they frequently yield, when a trader largely indebted to them is approaching bankruptcy, to sustain his credit by additional advances, in the hope that he may retrieve his affairs, and pay in full both the old and the new advances. The result is often the loss of both.

Bankers perform another very important function: they *remit* money from one place to another. A debtor in one city makes a payment to his creditor in another city in this way: he pays the money to a banker in his own city, who, for a small charge, called the *exchange*, gives him a draft for the amount on a banker, his correspondent, in the other city. The debtor transmits the draft to his creditor, who presents it to the banker in the other city, and receives the money from him. No actual transmission of the money, however, takes place, for there are debtors in the other city requiring to pay money to creditors in the first city, and these debtors effect the payment by giving the money to the banker in the other city, and obtaining his drafts on the banker in the first city. The one set of drafts are thus set off against the other. Not only may remittances between two places be thus made without the use of money, but the payments in both places may also be made without it. The debtors may pay for the drafts by checks on the banker who grants them, and the creditors may receive the money by drawing checks on the banker by whom the drafts are made payable. For another function of banks, see MARGINAL CREDITS.

The large amount of money transactions without the intervention of coin or bank-notes is inconceivable to those not in business. The manner in which these transactions may be effected without money, would be at once apprehended, if all persons in the same locality dealt with the same bank, and if all the banks scattered throughout the kingdom were only branches of the same establishment. But in practice, matters are so managed as if this were the case. The checks, bills, or other drafts which come into the hands of a banker, drawn on (that is, payable by) other bankers, are set off and liquidated by drafts, which they have received, drawn on him. The balance or difference only is paid in money. In London, New York and other centres, there is an establishment called the Clearing-house

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(q.v.), or which most of the local banks are members. There, at a fixed hour daily, attendance is given by a clerk from each of these banks, who presents all the drafts immediately payable which his bank holds on the others; the balance or difference, on the whole, for or against each bank is ascertained; and the bank which holds a less amount of drafts on others than they hold on it, pays the difference by certificates of some bank designated for that purpose. The total clearings in the United States (1895) were \$51,111,591,928, of which \$28,264,379,126 were from New York city. There are similar clearing-houses in very many British towns, and in the chief cities of the United States.—See BANKS IN THE UNITED STATES: BANK OF ENGLAND BANKS IN ENGLAND, ETC.: CLEARING-HOUSE, in Banking: SAVINGS BANKS: CURRENCY: FINANCE: MONEY.

BANK-NOTES, MANUFACTURE OF: the chief thing to attend to in the manufacture of bank-notes is the rendering of their forgery impossible, or at least easy of detection. This is sought to be effected by peculiarity of paper, design, and printing. Bank of England notes are printed in one of the blackest and most indelible of inks on paper expressly made for the purpose by one firm only. It is a hand-made paper remarkable for its strength, lightness, and difficulty of imitation. Its peculiar water-mark constitutes one of the chief safeguards of the notes against forgery. No Bank of England notes are issued twice, so that this mark is rarely indistinct, and the paper does not lose its peculiar crispness. Some years ago a self-registering machine was invented for impressing on each note a distinctive mark known only to the bank authorities. Owing to some of their notes printed simply in black ink having been successfully forged by photography, those issued by the Scotch banks have since 1858 been printed in colored inks, at least two colors being used for each note. In order still further to lessen the risk of forgery, a new kind of note was in 1885 issued by the Bank of Scotland, printed in brown, yellow, and blue. The paper is of a similar kind to that used for the Bank of England notes, with an elaborate and easily recognized watermark. Many bank-notes of other countries are printed in colored inks.

Between 1837 and 1855 the plan of Perkins and Heath for reproducing an engraved steel plate by the use of the mill and die continued in use in the Bank of England. The pattern is engraved on a soft steel plate, which is then hardened, to transfer the pattern by pressure to a soft steel roller, on which, of course, the pattern is produced in relief; the roller or mill is then hardened, to reproduce the pattern in the plate from which the printing is to be done; and thus almost any number of plates for all common purposes can easily be produced.

In 1855 electrotpe-printing was introduced by Mr. Smee, with the assistance of the mechanical officials (see ELECTRO-TYPING); and since that time, the notes of the Bank of England have all been produced by surface-printing by the electrotpe.

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The usual production of notes by this bank equals a value of about £24,000,000 per week. There are seventy or eighty kinds of Bank of England notes, differing in their denominations or values, but similar in the mode of printing. Zincography and lithography are employed by some banks for the printing of their notes; and also *acierage*, a mode of hardening copper electrotypes with a thin surface of steel.

The manufacture of bank-notes is now carried on by the U. S. government in the treasury department at Washington. The notes are printed on a distinctive silk-threaded fibre paper issued in sheets from the office of the sec. of the treasury, to the bureau of engraving and printing for each fiscal year. There were on hand in the bureau of engraving attached to the treasury dept. 1893, Feb. 1, 806,176 sheets, finished and unfinished, of national bank-notes, of denominations \$1, \$2, \$5, \$10, \$20, \$50, and \$100; representing a total value of \$36,339,480. During the fiscal year of the bureau ending 1892, Sep. 30, there were completed 13,728,494 sheets of U. S. notes, treasury notes, gold certificates, silver certificates, bonds, and national bank-notes; having the enormous face value of \$709,760,800. The sheets on which the currency is to be printed are counted as soon as received, and the result reported for verification. The notes are printed from dies, a separate die being needed for every shade of color used. These dies are made of highly polished steel, upon which the designs are first sketched, and which are then carefully engraved, the lines which take the ink being cut into the plate instead of being raised above its surface as in wood engraving. Scroll-work and elaborate tracery are done by machinery. Such work is made by a machine which by changing the combination never reproduces the same design. The ink for printing is made on the spot, nothing but the finest colors and the best boiled linseed oil being used. The presses used are simple cylinders operated by long-handed levers, each of them being attended by three men and a girl. A workman with a plate-printer's roller rapidly covers the plate with ink, and passing it to another operator at his side it is wiped with soft cotton cloth, then polished with the palm of the hand covered with whiting, an operation which removes the ink from the surface of the plate but not from the engraving. This being done the plate is laid face upwards in the press. The girl carefully lays upon the plate a sheet of damp paper, the pressman turns the levers, the cylinder revolves, the plate passes under it and the paper is removed bearing upon its face a perfect impression. Whenever a printer has finished the work assigned to him, he makes it up into packages of a hundred impressions and hands it to a clerk, being credited with the delivery. The counting and inspection are of the most critical kind.

BANK OF ENGLAND: the most important financial institution in the world; in the centre of London, with a branch at the west end and nine branches in the provinces: incorporated 1694, July 27. It was projected by William Paterson

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(q.v.), and was constituted as a joint-stock association, with a capital of £1,200,000, which was lent at interest to the government of William and Mary, then in a state of embarrassment. At its very outset, therefore, the Bank of England was a servant of government; and in a lesser or greater degree, it has had this character through all the stages of its subsequent history. At first the charter of the Bank was for eleven years only; but in consequence of the great services of the institution to government, its charter has been at various times renewed. The last renewal was in 1844, and the charter of that year still subsists, its terms being subject to modification or revocation by the legislature at pleasure. By the act or charter of 1844, the Bank was divided into two departments—the *issue* and the *banking*. What led to the division was this: it was supposed that, when a foreign drain of gold from Britain set in, it would, if the currency or circulation in Britain had been purely metallic, have produced a contraction of the circulation, and a consequent fall of prices, and, as an ultimate result, the cessation of the drain. It was further supposed that banks could issue their notes to any extent they pleased; that their excessive issues increased the currency, and therefore increased prices, which in their turn led to foreign drains; and that, on the occasions of these drains, the continued issues prevented the natural and desirable contraction of the circulation, and aggravated the commercial convulsions occurring at such periods. The object of the act of 1844 was to prevent issues of notes beyond a certain amount, unless against an equal amount of gold held by the issuing bank, so that the mixed currency of notes and coin might thus expand and contract like a self-acting metallic currency. Experience, however, has shown that when these foreign drains occur, the gold exported is taken chiefly from the reserves in the Bank of England, being withdrawals of deposits or loans by the Bank; and that the amount of notes in the hands of the public has not been affected by the legislation of 1844. In practice, whenever there are signs of a foreign drain, and the reserve of the Bank is diminishing, the Bank counteracts the tendency to a drain by raising the rate of discount and restricting its loans; the purchasing power of the public is thereby limited, and prices kept down; and, at the same time, gold is attracted to Britain for investment. The circulation is in reality not interfered with. It was also intended by the act of 1844 to add to the security of bank-notes by insuring a supply of gold to meet the payment of them at all times. But the solvency of the Bank of England is undoubted; its notes would at any time be taken as gold; and this effect of the act of 1844, and the supplementary act of 1845, has in the case of the notes of other banks been hitherto inappreciable.

In the *issue* department of the Bank of England, its sole business is to give out notes to the public. Before the separation of the departments, the government was owing the Bank £11,015,100. This sum was declared to be now a debt due to the issue department, and for the issues of

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notes to that amount no gold requires to be held by it. This was just the same thing as if the Bank had originally lent £11,015,100 of its notes to government, and these notes had found their way into circulation. The Bank was also allowed to issue additional notes on securities—that is, to lend them on a limit which at present amounts to £3,984,900, and this also without holding gold. The amount of notes which may thus be issued, without gold being in reserve against it, is £15,000,000. All notes issued above that amount can be issued only in exchange for gold. At the passing of the act in 1844, the limit of notes to be issued against the government debt and securities was fixed at £14,000,000—experience having shown that there was not the least risk of there being at any time less than that amount of Bank of England notes in the hands of the public. The addition of the £1,000,000 is an extra issue, authorized by the act, in consequence of certain issuing banks having since ceased to issue. The Bank has to account to government for the net profit of this issue loan of notes of £1,000,000, and the profit the Bank derives from its issue department is the interest received on the £14,000,000 of government debt and securities, which at 3 per cent. is £420,000 yearly. But out of this the Bank pays to government, for its banking privileges, and in lieu of stamp-duties, £180,000. If we assume the expense of the issue department to be £160,000, the net profit upon it would be £80,000. The Bank also makes a profit upon bullion and foreign coin. These are brought to the Bank for notes; they are worth £3 17s. 10½d. per ounce; but the Bank is obliged by its charter to purchase them at £3 17s. 9d. The holders prefer taking this price to having their bullion and foreign coin coined, free of charge, at the public mint, as the delay in the coining is equal to a loss of interest of 1½d. per ounce. The amount of notes in the hands of the public averages about £25,000,000; but the amount issued by the *issue* department is greater. The difference is the amount lying in the *banking* department, and represents the reserve of gold of that department; that is to say, the banking department retains only a half or three fourths of a million of coin, and transfers the bulk of its reserve to the issue department, in exchange for notes. It is therefore requisite to regard the reserve of the banking department as gold, though lying in the shape of notes issued by the other department.

Viewed in its *banking* department, the Bank differs from other banks in having the management of the public debt, and paying the dividends on it; in holding the deposits belonging to government, and in making advances to it when necessary; in aiding in the collection of the public revenue, and in being the bank of other banks. For the management of the public debt, the Bank receives about £247,000, against which there has to be set £124,000 of charges. The remaining profits of the Bank are derived from its use of its deposits, on which it allows no interest, and of its own capital. The capital was originally £1,200,000; in 1816, it reached £14,553,000—the present

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amount. There is also a surplus fund held in reserve of about £3,200,000. Public deposits vary from £3,500,000 to £20,000,000; private deposits from £20,000,000 to £30,000,000. In 1894, Oct., the deposits, public and private, were £37,455,029; notes in circulation £26,363,260.

In 1797, the Bank found itself likely to be obliged to suspend payments, and its notes were declared by law a legal tender, although no longer convertible into coin. This state of affairs continued till 1821. The notes during this interval not having been convertible into coin on demand, there was no check upon the Bank in the amount of its issues; and the currency became depreciated—that is, a £5 note would not exchange for five sovereigns; and every man to whom £5 was due was thus obliged to accept payment in a £5 note, not worth £5. It is, however, said that the value of gold at the time was enhanced owing to absorption by hoarding and by military-chests, and that the depreciation was more apparent than real. The export of gold following on a rise of prices occasioned by an issue of bank or government notes is unlimited, except by exhaustion, if these notes are not payable in coin on demand, and are issued without any check from without or self-imposed. But as prices estimated in these notes rise, the price of bullion, like other commodities, rises too, and the price of coin which can be converted into bullion, or be used abroad at its previous purchasing power, rises also. Since 1821, the Bank has been oftener than once on the verge of a suspension of payments, owing to foreign drains of gold. The separation of the Bank into two departments is regarded by many as having a tendency to produce a suspension in times of panic, when the reserve is reduced by withdrawals to supply a foreign drain, or to meet an internal run. Before the separation, the Bank, in the case of withdrawals of gold, had the whole amount of gold within the Bank to meet them; but now it loses the command of all the gold in the issue department. It cannot get that gold unless in exchange for notes, but, its reserve being reduced or exhausted, it has none to spare. The restriction of credit consequent upon the approach to an exhaustion of the reserve of the banking department, is so great, that the fear of it occasions a panic; and in 1847, 1857, and 1866, on the possible suspension of payments by the banking department, owing to a reduction of its reserve, being apparent, the government of the day took the responsibility of authorizing the Bank to lend additional notes, not represented by gold, which was an indirect way of getting at the gold in the issue department, where the object of the borrowers was to obtain gold. In 1857, it was found necessary to take the benefit of this authorization.

BANK OF FRANCE: chief financial institution in France; and second in magnitude and importance to the Bank of England only. The B. of F. was founded 1800, but was not placed on a solid and well-defined basis till 1806. Its capital, originally \$9,000,000, was then raised to about \$18,000,000, or 90,000,000 francs, in shares of

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1,000 francs (about \$200) each. Of these shares, 67,900 have passed into the hands of the public; the remaining 22,100, having been purchased by the bank out of surplus profits, were cancelled. Though the B. of F. is a private company, it is in reality a semi-official institution, its operations being under state control, and its gov. and deputy-govs. being appointed by the state. The B. of F. has had the monopoly of issuing bank-notes since 1848, when the shareholders of 9 banks of issue in the country acquired 23,351 new shares of the B. of F.; the 9 banks then were constituted its branches.

The bank is required by law to open an account with any one who desires it. The bank discounts bills with 3 signatures at variable dates, but not having more than 3 mos. to run. Besides discounting bills, the bank makes advances on stocks and pledges of different kinds, and undertakes the care of valuable articles, e.g., plate, jewels, title-deeds, etc., at a charge of $\frac{1}{8}$ per cent. on the value of the deposits for every period of 6 mos. or less.

The administration of the bank is vested in a council of 21 members—viz., a gov. and two deputy-govs., appointed by the chief of the state, 15 directors and 3 censors, appointed by the shareholders. The board of directors meets once a week, fixes the rate of discount—which rarely varies from 3 per cent.—and decides all questions touching the bank's transactions. Of the members of the directorship $\frac{1}{5}$ go out of office annually. Five of the directors must be chosen from among manufacturers or merchants who are stockholders, and 3 from among certain officials of the public treasury—the *trésoriers-payeurs généraux*. These functionaries are chosen to a place in the directorship because the large amount of govt. money that they handle must be kept at the bank. There are 5 committees of directors, each one superintending a special branch of the bank's transactions. The 3 censors (or examiners) supervise all the business done; their unanimous non-consent suspends all new issues of bank-notes.

The 1,000-francs (about \$200) share of the stock was, 1856, July, worth 4,075 francs: it had fallen, 1857, July, to 2,880. It was worth (1875) 2,880 francs; (1890) 4,365.

Unlike the Bank of England, which is limited in its issues of bank-notes to about \$176,000,000, the B. of F. can issue bills to the amt. of \$700,000,000; the aggregate circulation 1890, Dec., was abt. \$617,000,000. When, 1890, Nov., the B. of F. went to the assistance of the banks of England, during the monetary stringency produced by the financial difficulties of the Barings, its vaults contained in gold 1,196,500,000 francs (about \$239,300,000), and in silver 1,244,000,000 (about \$249,000,000).

BANKRUPT, n. *bāngk'rŭpt* [F. *banqueroute*, bankruptcy: Sp. *bancarotta*: It. *banco*, a merchant's place of business: Eng. *bank*; L. *ruptus*, and OF. *roupt*, broken]: a merchant or trader whose credit is broken with the bank; any one who becomes unable to pay his just debts: **ADJ.** declared to be in debt beyond the power of payment: **V.** to

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disable one from paying the claims of his creditors. **BANK'-RUPTING**, imp. **BANK'RUPTED**, pp. **BANKRUPTCY**, n. *băngk' rŭpt-sŭ*, the state of being a bankrupt; the act of becoming a bankrupt; failure in trade; the insolvency of a merchant or trader: see **INSOLVENCY**. **TO MAKE BANKRUPT**, to make insolvent; to cause to be declared in indebtedness beyond the power of payment. See **DYVOUR AND DYVOUR'S HABIT**.

BANKRUPTCY, or **INSOLVENCY**: in law, the state of a person declared unable to pay his debts. The law formerly made a distinction, no longer observed, between **B.** and *insolvency*, **B.** being the term applied to the condition of a 'trader' who cannot pay his debts, and insolvency to that of a person not a trader. The distinction was abolished in England by the **B. Act of 1869**. In the United States the two terms are used indifferently, both by law-makers and by jurists; though laws of congress have usually been called Bankrupt laws, and those of the states usually Insolvent laws. As long as the English distinction between the two classes of insolvent debtors was maintained, there were different courts, called bankrupt and insolvent courts, for traders and non-traders respectively. The non-traders comprised country gentlemen, professional men, 'gentlemen at large,' and nondescripts of every degree. Traders were brought into the court of **B.** on petition usually of their creditors; while non-traders petitioned the insolvency court voluntarily. The bankrupt was regarded and treated as a criminal; and formerly his neglect or refusal duly to surrender his property under a commission of **B.**, when summoned, was a capital felony. In the **B.** court forcible possession was taken of the trader's property and assets of every kind, which were converted into money, and the proceeds distributed *pro rata* among the creditors; thus the debtor was stripped of everything salable that he had, with a few trifling exceptions; but on the other hand he received a certificate which entirely cleared him of the incumbrance of any past debts forever, freeing him from imprisonment and even from future liability. On the other hand, the non-trader insolvent was required to give up all his property, and to state fully all the debts and liabilities that he had incurred; thereupon he was discharged: but liability for the debts still remained, a burden on his future. But the rigor of the law was modified by the practice of the courts, and considerable leniency was shown the insolvent debtor, so that practically both in **B.** and in insolvency the debtor was more or less whitewashed, and was at least exempted from imprisonment. The **B.** laws of England date from the reign of Henry VIII., and at first were directed mainly against the criminal frauds of traders; the insolvency laws date from the reign of Elizabeth, and the distinction noted above was always observed until the 'bankrupt act' of 1861 abolished the 'court for the relief of insolvent debtors,' and transferred its jurisdiction to the court of **B.**, thus making non-traders also subject to the law of **B.** In 1868-9, further changes were made; and finally the 'bankruptcy act' of 1883 abolished the special 'court of **B.**,' and trans-

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ferred its jurisdiction to the 'high court of justice,' in causes in the London district, and to the county court elsewhere. A large part of B. jurisdiction, however, is exercised by the registrars, and all the B. courts have very large discretionary powers in procedure.

By the constitution of the United States, art. 1, sec. 8, congress has 'power to establish a uniform rule on the subject of . . . bankruptcies throughout the United States,' and under that power B. laws were enacted 1800 (repealed 1803), 1841 (repealed 1843); and 1867 (repealed 1878). The act of 1878, June 7, annulled all then existing B. legislation, and no further laws on the subject were enacted till the act of 1898, July 1. This act provides a complete system throughout the United States, and for its administration by the United States courts in place of the different systems formerly in existence in the various states administered by state courts. In bankruptcy proceedings, a bankrupt debtor may turn over all his property to the court, to be administered for the benefit of his creditors, and then get a complete discharge from his debts. A bankrupt may of his own motion offer to surrender his property to the administration of the United States court and ask for his discharge in voluntary bankruptcy, or creditors may apply to the court to compel a bankrupt to turn over his property to be administered under the act for the benefit of the creditors in voluntary bankruptcy. The bankrupt who has turned over all his property and conformed to the provisions of the act, is entitled to a judgment of court discharging him from any future liability to his creditors. Sec. 4 of the act sets forth who may become bankrupts as follows: (a) Any person who owes debts, except a corporation, shall be entitled to the benefits of this act as a voluntary bankrupt. (b) Any natural person (except a wage-earner or a person engaged chiefly in farming or the tillage of the soil), any unincorporated company, and any corporation engaged principally in manufacturing, trading, printing, publishing, or mercantile pursuits, owing debts to the amount of one thousand dollars or over, may be adjudged an involuntary bankrupt upon default or an impartial trial, and shall be subject to the provisions and entitled to the benefits of this act. Private bankers, but not national banks or banks incorporated under state or territorial laws, may be adjudged involuntary bankrupts.

The provisions under which a man can be thrown into bankruptcy against his will are as follows: (1) Where a man has disposed of his property with intent to defraud. (2) Where he has disposed of his property to one or more creditors to give a preference to them. (3) Where he has given a preference through legal proceedings. (4) Where a man has made a voluntary assignment for the benefit of his creditors generally. (5) Where a man admits in writing that he is bankrupt. The last two provisions are practically voluntary proceedings. Under the common law, a man is considered insolvent when he cannot pay his debts when they are due; under the new law, he is deemed insolvent only when his property, fairly valued, is insufficient to pay his debts. Only two offenses are cited

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under the new law: one when property is hidden away after proceedings in bankruptcy have been begun, and the other when perjury is discovered. Discharges are to be denied in only two cases; one, in which either of the offenses detailed has been committed, and the other, when it is shown that fraudulent books have been kept. The term of imprisonment for either of these offenses is not to exceed two years.

Sec. 7 defines the duties of bankrupt's as follows: (a) The bankrupt shall (1) attend the first meeting of his creditors, if directed by the court or a judge thereof to do so, and the hearing upon his application for a discharge, is filed; (2) comply with all lawful orders of the court; (3) examine the correctness of all proofs of claims filed against his estate; (4) execute and deliver such papers as shall be ordered by the court; (5) execute to his trustee transfers of all his property in foreign countries; (6) immediately inform his trustee of any attempt, by his creditors or other persons, to evade the provisions of this act, coming to his knowledge; (7) in case of any person having to his knowledge proved a false claim against his estate, disclose that fact immediately to his trustee; (8) prepare, make oath to, and file in court within ten days, unless further time is granted, after the adjudication if an involuntary bankrupt, and with the petition if a voluntary bankrupt, a schedule of his property, showing the amount and kind of property, the location thereof, its money value in detail, and a list of his creditors, showing their residences, if known (if unknown that fact to be stated), the amount due each of them, the consideration thereof, the security held by them, if any, and a claim for such exemptions as he may be entitled to, all in triplicate, one copy of each for the clerk, one for the referee, and one for the trustee; and (9) when present at the first meeting of his creditors, and at such other times as the court shall order, submit to an examination concerning the conducting of his business, the cause of his bankruptcy, his dealings with his creditors and other persons, the amount, kind, and whereabouts of his property, and, in addition, all matters which may affect the administration and settlement of his estate; but no testimony given by him shall be offered in evidence against him in any criminal proceedings.

Provided, however, that he shall not be required to attend a meeting of his creditors, or at or for an examination at a place more than one hundred and fifty miles distant from his home or principal place of business, or to examine claims except when presented to him, unless ordered by the court, or a judge thereof, for cause shown, and the bankrupt shall be paid his actual expenses from the estate when examined or required to attend at any place other than the city, town, or village of his residence. Provision is made in the act for allowing bankrupts to compromise or settle with their creditors by a proceeding known as composition proceedings, and the aim of

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the act is to make the expense of the proceedings depend largely upon the amount of property involved.—See DEBT, ACTION OF: DEBT, IMPRISONMENT FOR: DEBTOR AND CREDITOR, LAWS OF: DEBTS, RECOVERY OF: HOMESTEAD ENTRY: HOMESTEAD LAWS: IMPRISONMENT.

BANKS, in Navigation: elevations of the bottom of the sea; when moderately smooth at the top, they constitute *shallows, shoals, and flats*; but when rocky, they are *reefs, ridges, keys*, etc. A chart, properly prepared, always defines them by means of small dots, if sands, and small crosses, if rocky. The Newfoundland B. and the Bahama B. are well-known examples.

BANKS, IN ENGLAND, WALES, SCOTLAND, IRELAND, ETC.—*Joint-stock and Private Banks*.—In 1878 there were 119 of these banks, of which 52 in the provinces were entitled to issue notes to the amount of £2,164,221 without its being compulsory to hold any gold against them. But as they are prohibited from exceeding their authorized issue, the amount of notes actually in the hands of the public is always somewhat less. The deposits of the 10 Joint-stock Banks in London which may be considered London banks, and excluding the National Provincial Bank of England, the National Bank, and the Scotch banks, which, though they carry on business in London, have the great bulk of their business in the country, amount to about £80,000,000, and the acceptances granted by them to about £17,000,000. Their paid-up capital is £9,270,000. Under the Companies Acts 1879 and 1880, several of the principal joint-stock banks have become limited liability companies. They usually allow interest upon money deposited to remain for some time.

In 1902, June, there were reported 72 joint-stock banks, making returns in England and Wales; 2 in the Isle of Man; 11 in Scotland; and 9 in Ireland. There were 30 offices in London of colonial joint-stock banks and 23 offices of foreign banks. The paid-up capital of the English, Scotch, Irish, colonial and foreign joint-stock banks aggregated £138,245,000, and the assets, £1,320,899,000. The total number of banks in the United Kingdom, joint-stock and private, 1901, was 336.

Banks in Scotland.—The earliest banking institution in north Britain was the Bank of Scotland, instituted by a charter of incorporation from the Scots parliament 1695. The original capital was £1,200,000 Scots, or £100,000 sterling. In 1774, the amount of stock was extended to £200,000 sterling; now it is £1,250,000 sterling. In 1727, a new and similar establishment was constituted under the title of the Royal Bank of Scotland, whose advanced capital is now £2,000,000. In 1746 another association was formed, and incorporated by royal charter, with the title of the British Linen Company. From £100,000, its capital has increased to £1,000,000. Besides those three banks, there are in Scotland other seven joint-stock banks, with capitals varying from £1,000,000 to £150,000. There

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are now no private banks. The amount of deposits in 1902 was over £107,136,000, on which interest is allowed. Their authorized issue of notes is £2,676,350, but their actual issue is about double that amount.

In consequence of allowing interest on deposits, the banks in Scotland may be said to hold the whole capital of the country, minus only the money passing from hand to hand. This system of depositing is aided by branches from the parent-banks; and these branches are found in every small town. There are 11 joint-stock banks with 1,100 branches. At these branch-banks the agent (usually a respectable person in business) discounts bills within certain limits, issues letters of credit, and pays out notes, and also gives cash on demand for them; though, strictly, the notes of a bank are payable only on demand at the head-office. By a strict system of supervision, Scottish branch banks are usually well conducted, and are of great service in every department of trade. For one thing, they have powerfully contributed to extinguish burglary and highway robbery, as no one thinks of keeping money, except to a small amount, either in his house or about his person. At all the great fairs, bankers attend to receive deposits, and to pay checks. Forgeries of Scottish bank notes are now very unusual.

Banks in Ireland.—There are one national and 9 joint-stock banks, with 652 branches. Their authorized issue is £6,354,494; of which £3,738,428 is that of the Bank of Ireland. It is a national bank, lending £2,630,769 of its capital to government. It was established 1783, with privileges resembling those of the Bank of England. Its capital is £2,769,230, and its surplus £1,034,000. The capitals of the other banks vary from £250,000 to £1,500,000, and the total capital of the joint stock banks in Ireland is £6,809,230. Six are banks of issue. The circulation of the bank of Ireland 1902 was £6,392,000; the greater part of its capital has been loaned to the government. Interest is allowed on money deposited for a stated period, but not on money at call, or as a rule on current accounts. The capital of all joint-stock banks in the kingdom and of the Bank of England 1903 was £77,644,563.

European and Colonial Banks.—On the continent of Europe, there are both national or incorporated banks and private banks. The national banks are, to a greater or less extent, government establishments, managing the public debt and finances, and, unlike the Bank of England, subject to government influence or interference. In India and the British colonies, there are joint-stock banks and private bankers. The joint-stock banks of Australia are establishments of magnitude.

BANKS IN THE UNITED STATES: these comprise banks of circulation, deposit, and discount, and savings banks, (q.v.): nearly all the former being at present national banks. The power to print and circulate notes as money began, in this country, with the issue by the colony of Massachusetts, 1690, of bills of credit payable on demand. This was fol-

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lowed, during the next half-century, by similar action on the part of the other colonies. In 1712, South Carolina had a bank, in 1723, Pennsylvania, and Massachusetts one in 1739. The issue of the 'Continental currency' during the Revolution resulted in such a depreciation of that money that by 1781 it was worthless, though it was redeemed latter at an enormous discount. The beginning of 1782 found the Bank of North America in Philadelphia under a charter from Congress; and two years later it was in operation, with charters also from New York and Pennsylvania. Then the Bank of New York was chartered, and then the Bank of Massachusetts, 1784, and soon all the states had banks. The constitution, going into operation 1789, forbade the issue of money by the states. The charter for the United States Bank went into operation 1791, and lasted 20 years. By that time there were nearly 90 state banks in existence, opposed to the renewal of the charter of the United States Bank; and, in 1814 there were 150 of these, with a combined circulation of \$62,000,000. But the war of 1812 brought disaster to many of these institutions, and depreciated the paper of others, and in 1816 it was found necessary to charter a second United States Bank, with the right to establish branches in different cities. The capital of this bank was \$35,000,000, of which the government held \$7,000,000; the bank was the government depository, and its issue was made a legal tender. This action by the government strengthened the state banks, and they increased rapidly in number, so that in 1830 there were 330. In 1832, President Jackson vetoed a bill renewing the charter of the United States Bank, and removed therefrom the government deposits, when the institution speedily collapsed, leaving the bank system to banks chartered by the several states. In 1842, there were 577 state banks, with a capital of \$229,000,000, and \$59,000,000 circulation. But there grew into existence a doubt as to the security of these institutions, and this brought about the establishment by the state of New York of the 'safety-fund system,' by which a banking department of the state was formed, with which every bank kept on deposit federal or state stocks, or bonds and mortgages, for the purpose of liquidation in case of failure. One great difficulty involved in the state banking system was the prevalence of counterfeiting; another was the different estimation in which the issues of the banks of different states were held at the financial centres. These troubles had culminated at the period of the Rebellion, so that the business community was ripe for the important experiment of the National Banking System.

The 'Act to provide a National Currency secured by a pledge of U. S. bonds, and to provide for the circulation and redemption thereof,' was passed by congress (approved 1864 June 3), and under this act most of the state banks became national, and deposited with the U. S. treasury bonds to secure their circulation, in accordance therewith. This act established in the treasury department the 'Bureau of the National Currency,' and the office of 'Comptroller of the

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Currency,' charged with the execution of the laws regarding a national currency; it gave absolute security to the holders of national bank notes, by providing for deposits of bonds on the part of the B. with the U. S. treasurer; and it made national bank notes of equal value in any part of the country; thus doing away, at once, with all the objectionable features of the old system of state banks. The national banks were, until 1883, obliged by the law to pay: 1. One-half of one per cent. semi-annually on the allowed circulation; 2. One quarter of one per cent. semi-annually on the average deposits for the half-year; 3. One quarter of one per cent. on capital not in government bonds. Each bank must keep with the treasurer of the United States, in legal tender notes, for the redemption of its bills, five per cent. of the amount of its circulation; and must retain constantly in its own vault two-fifths of fifteen per cent. of its deposits.

In 1860 the amount of circulation of the state banks was \$207,000,000. The first issue of treasury notes was in that year \$10,000,000, and this was followed by the issue of 'demand notes,' 'legal tenders,' 'two years' notes,' 'sixty-day notes,' and 'three years' notes,' in all to the amount of \$700,000,000, including \$50,000,000 of 'fractional currency.' Many of these issues were retired, and by the act of 1874, June 22, the extreme volume of U. S. notes was fixed at \$382,000,000. Under the national banking system, the issue of the banks amounted, 1874, to \$351,927,246. Between 1873 and 1877 there was a contraction of legal tenders and national bank notes amounting to about \$75,000,000. The following tables show the number and condition of the national banks at different periods, and also the amount and nature of the paper circulation since 1874:

The National Banks of the United States.

Year ending Sep. 1.	No of Banks.	Capital.	Surplus.	Total Dividends.	Total Net Earnings.
1874	1,971	489,938,284	128,364,039	48,459,305	59,580,931
1875	2,047	497,864,833	134,123,649	49,068,601	57,936,224
1876	2,081	500,482,271	132,251,078	47,375,410	43,638,152
1877	2,072	486,324,860	124,349,254	43,921,085	34,866,990
1878	2,047	470,231,896	118,687,134	36,941,613	30,605,589
1879	2,045	455,132,056	115,149,351	34,942,921	31,551,860
1880	2,072	454,215,062	120,145,649	36,411,473	45,186,034
1881	2,100	458,934,485	127,238,394	38,377,485	53,622,563
1882	2,197	473,947,715	133,570,931	40,791,928	53,321,234
1883	2,350	494,640,140	141,232,187	40,678,678	54,007,148
1884	2,582	518,605,725	147,721,475	41,254,473	52,362,783
1885	2,665	524,599,602	146,903,495	40,656,121	43,625,497
1886	2,784	552,459,921	155,030,884	42,412,863	55,165,385
1887	3,049	578,462,765	173,912,440	44,152,407	64,506,869
1888	3,093	583,539,145	184,416,990	46,531,657	65,360,466
1889	3,170	596,302,518	194,818,192	46,618,060	69,618,265
1890	3,353	625,089,645	208,707,786	51,158,883	72,055,563
1891	3,577	660,108,261	222,766,668	50,795,011	75,763,614
1892	3,701	679,076,652	237,761,565	50,400,713	66,658,015
1893	3,759	684,342,024	246,918,673	49,633,196	68,750,952
1894	3,755	672,951,450	246,001,328	45,333,270	41,955,248
1895	3,716	660,257,065	247,466,002	45,969,663	46,866,557
1902	4,601	705,535,417	326,393,953	39,517,619	57,797,746

BANKS.

Outstanding Currency of the United States and of the National Banks, 1868-1902.

Date.	United States Issues.			Notes of N. Banks, includ. Gold Notes.	Aggregate.
	Legal Tender Notes.	Old Demand Notes.	Fract'nal Currency.		
Jan. 1, 1868	\$356,000,000	\$159,127	\$31,597,583	\$299,846,206	\$687,602,916
" 1, 1869	356,000,000	128,098	34,215,715	299,747,569	690,091,382
" 1, 1870	356,000,000	113,098	39,762,664	299,629,334	695,505,084
" 1, 1871	356,000,009	101,086	39,995,089	306,307,672	702,403,847
" 1, 1872	357,500,000	92,801	40,767,877	328,465,431	726,826,109
" 1, 1873	358,557,907	84,337	45,722,061	344,582,812	748,947,167
" 1, 1874	378,401,702	79,637	48,544,792	350,848,336	777,874,267
" 1, 1875	382,000,000	72,317	46,390,598	351,128,250	781,591,165
" 1, 1876	371,827,220	69,642	44,147,072	346,479,756	762,523,090
" 1, 1877	366,055,084	65,462	26,347,206	321,595,606	714,064,258
" 1, 1878	349,943,776	63,532	17,764,109	321,672,505	689,443,422
" 1, 1879	346,681,016	62,035	16,108,159	323,791,674	686,642,884
" 1, 1880	346,681,016	61,350	15,674,304	342,387,336	704,804,006
" 1, 1881	346,681,016	60,745	15,523,464	341,355,203	706,620,428
" 1, 1882	346,681,016	59,920	15,451,861	362,421,988	724,021,110
" 1, 1883	346,681,016	59,295	15,398,088	361,882,791	724,614,785
" 1, 1884	346,681,016	58,680	15,365,362	349,949,352	712,054,410
" 1, 1885	346,681,016	58,240	15,347,277	329,158,623	691,245,156
" 1, 1886	346,681,016	57,790	15,335,088	317,443,554	679,517,248
" 1, 1887	346,681,016	57,325	15,329,636	296,771,981	658,839,958
Nov. 1, 1887	346,681,016	57,105	15,319,850	272,041,203	634,099,174
" 1, 1888	346,681,016	56,807	15,297,254	239,385,237	601,420,314
" 1, 1889	346,681,016	56,442	15,291,624	201,925,826	563,954,908
" 1, 1890	346,681,016	56,032	15,286,561	179,755,643	541,779,252

In 1902 the U. S. notes aggregated \$346,681,016; national bank notes, \$356,672,091; treas. notes (Act 1890), \$30,000,000.

BANKS, *banks*, Sir JOSEPH: 1744, Feb. 13—1820, June 19; b. London; descended from a family of Swedish origin, which had been settled in England for about 200 years. Of this family was John, a writer of tragedies, in the latter half of the 17th c. Sir Joseph, the naturalist, was educated at Eton and Oxford. In 1763 he made a voyage to Newfoundland and Labrador, collecting plants; and, 1768-71, he sailed with Cook round the world in the capacity of naturalist, and wrote the botanical descriptions for the first voyages. In 1772 he visited the Hebrides and Iceland. In 1777 he was elected pres. of the Royal Society, an office which he held for 42 years; in 1871 he was created a baronet. He founded and managed the African Association; and the colony of Botany Bay owed its origin mainly to him. Through his efforts, the bread-fruit tree was transferred from Otaheite to the West Indies, and the mango from Bengal, as well as many of the fruits of Ceylon and Persia. Many naturalists and travellers—Blumenthal, Hornemann, Burckhardt, Mungo Park—and others were indebted to him for zealous and disinterested assistance in their labors. During the French war, B. did much to alleviate the sufferings of all captive men of science, and used his influence with government to procure the restoration of their papers. Cuvier, in his *éloge* on him before the French Acad. of Science, states that no less than ten times had collections, captured by the English, been restored to the Jardin du Roi at Paris through the instrumentality of B. No man of

BANKS.

science appealed to him in vain for pecuniary assistance; and his splendid library of natural history was at the service of those who desired to consult it. With the exception of articles in magazines, and contributions to the publications of learned societies, especially to the *Philosophical Transactions*, B. has written nothing but two small works—*A Short Account of the Causes of the Diseases in Corn called Blight, Mildew, and Rust*, printed for his friends 1803, and for the public 1805; and *Circumstances Relative to Merino Sheep* (London, 1809). He left a valuable library, of which an excellent catalogue was made by his friend Dryander; and a rich collection of specimens in natural history, both of which he bequeathed to the British Museum.

BANKS, SAVINGS. See SAVINGS-BANKS.

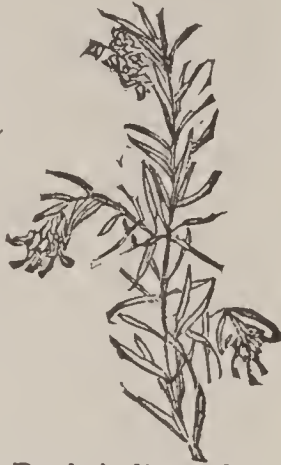
BANKS, *bāngks*, NATHANIEL PRENTISS, LL.D.: born Waltham, Mass., 1816, Jan. 30. He attended the common schools in his native place, and then learned the trade of machinist in a cotton factory. His evenings were given to study and to preparing for the lecture-field, which he entered while a mere youth. He was editor of a local paper, and after being admitted to the bar was elected to the state legislature 1849, was speaker of the house 1851, elected to congress 1852, and the following year was chairman of the Mass. constitutional convention. By voting against the Kansas-Nebraska Bill, he lost the support of his party, but was elected to congress 1854 by the republicans and know-nothings, and 1856 was chosen speaker of the house on the 133d ballot. He was returned to congress by the republicans, but resigned 1857, to become gov. of Mass. After serving three terms as gov., he became, 1860, pres. of the Illinois Central r.r., but resigned the office and was appointed maj.gen. vols. in the Union army 1861. He served in various campaigns till 1864, when, on account of the failure of an expedition against which he had strongly protested, he was relieved from command. He was returned to congress 1864, 66, 68, and 70, defeated 72, re-elected 74, and after serving as U. S. marshal for Mass. was again elected to congress 1888, and defeated 1890. D. 1894.

BANKS, THOMAS: eminent English sculptor: 1735, Dec. —1805, Feb. 2; b. Lambeth. B. was apprenticed to a landscape gardener and architect, but soon abandoned these practical arts for sculpture. In 1770, B. won the gold prize of the Royal Acad. In 1772, with an allowance of £50 a year from the Acad. for three years, he went to Rome to study its masterpieces. After several years in Rome, during which he exhibited two of his finest works, *Carac-tacus Pleading before Claudius*, and *Psyche and the Butterfly*, and having gained much fame but little money, he returned to England. Here his refined imaginative style was little appreciated in comparison with the inferior style then in vogue; and after two years, he went to Russia, where he was well received by the Empress Catharine, who purchased his *Psyche*, and gave him a commission for a group called *Armed Neutrality*. Having executed this,

BANKSIA—BANK-SWALLOW.

he returned to England, where he completed perhaps his finest work, *The Mourning Achilles*, now in the British Institution; and was elected a member of the Royal Acad. The monuments of Sir Eyre Coote in Westminster Abbey, and of Captains Burgess and Westcott in St. Paul's Cathedral, were among his last works. It was in purely imaginative works that B. most excelled; in practical subjects, his introduction of the ideal was incongruous and inartistic, rendering his work in that department less satisfactory than that of some of his rivals.

BANKSIA, *băngk'sĩ-a*: genus of Australian shrubs of the nat. ord. *Proteaceæ* (q.v.), named in honor of Sir Joseph Banks. A few of the species become small trees. They have hard, dry leaves, generally white or very pale green beneath, and present a remarkable appearance from the umbellate arrangement of their branches, which bear towards their extremities oblong heads of very numerous flowers. The flowers secrete much honey. Some of the species are now frequent ornaments of green-houses. They abound in all parts of Australia, forming, indeed, a characteristic feature of its vegetation, and are called Honeysuckle trees. *B. grandis*, found at Swan river, exceeds all the rest of the genus in size, attaining a height of 50 feet.



Banksia littoralis
in flower.

BANKS LAND: island in the Arctic Ocean, 70 m. s.w. of Melville Island; intersected by the parallel of 74° n., and by the meridian of 116° w.

BANK-SWALLOW; called also **BANK-MARTIN**, or **SAND-SWALLOW**, or **SAND-MARTIN** (*Clivicola riparia*); bird of the swallow family (*Hirundinidæ*), named from the banks of earth where it excavates its nesting retreats. These are holes, often countless and close together in the face of a sandy cliff, and extending horizontally to the depth of 1-3 ft. or more. The genus, otherwise named *Cotile*, is distinguished by a tuft of feathers on the lower part of the tarsus, and by lustreless plumage; and this species is mouse-gray above, pale below, with a dusky brownish shade across the upper part of the breast. It is common in Asia, Europe, and America.



Fruit and Leaf of Banksia.

BANN—BANNATYNE CLUB.

BANN: name of two rivers in the n.e. of Ireland; the one the Upper B., flowing into, and the other, the Lower B., out of Loch Neagh. The Upper B. rises on the n. side of the Mourne Mountains, in the s. of Downshire, and runs 25 m. n.n.w. through the counties of Down and Armagh, successively in a granite, silurian, trap, and tertiary basin, into the s. side of Lough Neagh. It passes Banbridge, Gilford, and Portadown. At Portadown the Newry canal joins it. The Lower B., strictly the continuation of the Upper, issues from the n.w. corner of Lough Neagh, and flows 40 m. n.n.w. through Lough Beg, dividing the counties of Antrim and Londonderry. It runs past Portglenone and Coleraine, into the Atlantic Ocean 4 m. s.w. of Portrush. It has important salmon and eel fisheries. Vessels of 200 tons can reach Coleraine by the river, 4 m. from the ocean.

BANNATYNE CLUB, *băn'a tîn*: a literary society, named from George Bannatyne, who collected and preserved much of the Scottish poetry of the 15th and 16th c.: instituted, Edinburgh, 1823, by Sir Walter Scott. Its object was to print rare works illustrative of Scottish history, topography, poetry, miscellaneous literature, etc., in a uniform and handsome manner—the number printed of each being limited. The membership, originally 31, was gradually extended to 100, many of its members being men of high distinction: its first president was Sir Walter Scott, and its only secretary was David Laing. Its annual meetings seem to have been highly convivial. The Bannatyne Club printed 116 works, many of them rare and valuable.

BANNER.

BANNER, n. *băn'nēr* [F. *bannière*: It. *bandiera*—from *banda*, a strip of cloth; Goth. *bandva*, a sign]: a band or strip of cloth as a sign; a square flag; a flag or ensign. **BANNERED**, a. *băn'nêrd*, bearing banners. **BAN'NERLESS**, a. without a banner. **BANNERET**, n. *băn'nêr-êt* [F.]: a little banner. **KNIGHT BANNERET**, a knight dubbed for valor on the field of battle, and permitted to use his pennon as a banner. **BAN'NEROL**, n. [F. *banderole*]: a little flag; a streamer, See **BANDEROLE**.

BAN'NER: a piece of cloth attached to a pole, and usually bearing some warlike or heraldic device, or national emblem. In this sense B. is a generic term, including many species, such as standard, ensign, pennon, flag, etc. Banners have been used from the earliest times, and in all countries, for the purpose of directing the movements of troops. They are frequently mentioned in the Old Test., as in Num. ii. 2: 'Every man of the children of Israel shall camp by his standard, and under the ensign of his father's house.' The earliest Roman standard was a bundle of straw fixed to the top of a spear. This was succeeded by figures of animals—the horse, the boar, etc., all of which soon gave place to the eagle, which continued all along the chief Roman ensign, and was afterwards assumed by the German and later by the French emperors of the Napoleon dynasty. In addition to the eagle, each Roman cohort had a B., generally a serpent or dragon woven on a square cloth. The standard of the cavalry was a square cloth expanded on a cross, and it was to this that the term *vexillum* properly applied. Examples of these standards are sculptured on the Arch of Constantine at Rome. The top of the staff was also frequently adorned with a figure of Mars or of Victory, and in later times with the head of the reigning emperor. After Constantine embraced Christianity, the Cross was substituted for the head of the emperor on the purple B. of Byzantium. Standards were less in use among the Greeks than among other warlike nations; but a standard, and sometimes a scarlet flag, was employed as a signal for giving battle. On the rise of Chivalry, in the middle ages, the ordering of banners, like every other branch of military organization, attained an almost scientific exactitude. From the B.-royal, which bore the national emblems, to the small streamer attached to the lance, with its cross or stripes, there was a regular subordination, each emblem having its place and its meaning. The pennon of the simple knight differed from the square B. of the banneret (q v.), in being pointed at the ends. In addition to their varieties in size, shape, and color, these banners were distinguished by the emblems which they bore. One of the earliest is the Danish raven, depicted on the standard taken by Alfred, of which Asser mentions the tradition, that 'in every battle, wherever that flag went before them, if they [the Danes] were to gain the victory, a live crow would appear flying on the middle of the flag; but if they were doomed to be defeated, it would hang down motionless.' The privilege of carrying banners did not belong to princes

BANNER.

and knights alone; bishops and abbots displayed similar ensigns, which were carried before them in religious processions and under which their retainers fought in their defense. It was to these that the term 'Gonfalon,' a word as to whose origin much diversity of opinion exists, was more commonly applied. In place of the heraldic emblems of the knight, the B. of the church, and of towns and communes, usually bore the effigies of saints. Some banners, however, displayed no ensigns whatever, and were known simply by their color. Of this the *oriflamme*, or plain ruddy flag of St. Denis, was a famous example. The celebrated Bayeux Tapestry (q.v.) throws considerable light on banners, as well as on other matters connected



Roman Standards from the Arch of Constantine.

with the warlike arrangements of the middle ages. Much curious information on this and kindred subjects will be found in Hewitt's *Ancient Armour and Weapons in Europe*. By every warlike people the B. has been regarded as the emblem of national honor, as a palladium for whose defense the individual warrior was at all times ready to sacrifice his life. From the converse of this feeling, banners and flags taken from the enemy have always been regarded as special trophies of victory, and places of honor in churches and public buildings have consequently been assigned them. As to the flags borne by the ships of different nations, and the arrangements concerning them in peace and war, see FLAG: as to colors of regiments, see COLORS: as to the relation which banners bear to other kinds of flags, in their forms and uses, see COLORS. MILITARY: ENSIGN FLAG: PENDANT, etc.

BANNERET—BANNOCKBURN.

Banner displayed, is the term used by heralds to describe a B. open and flying.

BAN'NERET: a higher grade of knighthood conferred by the sovereign for some heroic act performed in the field of war, and so called because the pennon of the knight was then exchanged for the banner—which was effected by the simple means of rending the points from the pennon. The first B. in England is said by Froissart to have been made by King Edward I., and the last time the honor was conferred was probably after the battle of Pinkie, 1547; or perhaps (though this is doubtful) by Charles I. after the battle of Edgehill. The ceremony of the creation of a Knight-B. must have been very impressive to persons filled with the sentiments prevalent in the ages of chivalry. The king, or his general, at the head of his army, drawn up in order of battle after a victory, under the royal standard displayed, attended by all the officers and nobility of the court, received the B. elect, who was not necessarily a knight previously, led between two knights of note, or other men famous in arms, carrying his pennon in his hand, the heralds walking before him and proclaiming his valiant achievements, for which he deserved to be made a Knight-B. and to display his banner in the field. The king, or general, then said to him: 'Advance, Banneret!' (*Advances toy Banneret*), and caused the point of his pennon to be torn off. The new knight, with the trumpeters sounding before him, and the nobility and officers bearing him company, was sent back to his tent, where a noble entertainment was provided by the king. Some attempts have been made to revive the title in recent times, as when George III., at a review of the navy at Portsmouth, 1773, conferred it on Admiral Pye and several other officers.

BANNIANS: see BANIAN.

BANNOCK, n. *băn'nök*: [Scot.—from Gael. *bonnach*, a cake]: a cake of home-made bread, common in the country parts of Scotland, but now less so than formerly. It is usually of pease meal or of pease and barley meal mixed, prepared without any leaven; it is baked on a circular plate of iron, called a girdle. When made of mixed meal, it is called a mashlum bannock. A superior kind of B., called a Selkirk B., from the place where it is made, resembles the finer and lighter species of tea cakes prepared by bakers. In the w. of Scotland, the word B. is pronounced *bunnoch*. The B. is in fact the primitive cake, only varied in material, of every country.

BANNOCKBURN, *băn'nök bérn*: a village in the e. of Stirlingshire, 3 m. s.s.e. of Stirling; on the Bannock rivulet, which falls, a few miles below this, into the Forth. Near B. was fought the great battle of B., 1314, June 24, Monday. Robert Bruce, with 30,000 Scotch, gained a signal victory over Edward II., with 100,000 English, and secured his throne and the independence of Scotland. The English are said to have lost 30,000, and the Scotch 8,000 men. The 'Bore Stone,' on which Bruce is said to have fixed his standard on that eventful day, is still to be seen

BANNS—BANNSWARRA.

on an eminence near the scene of the fight. On the s.e. of the field of B., at Sauchie Burn, James III. was defeated, 1488 by his rebellious subjects, and assassinated after the battle in a mill where he had taken refuge. B. is now an important seat of the woollen manufactures, especially those of tartan and carpets. It has long supplied the tartan worn by the Highland regiments. Tanning is carried on to some extent. Coal abounds in the vicinity. Pop. (1891) 2,000.

BANNS, *bǎnz* [see BAN]: proclamation or public notice, especially of an intended marriage, given in a church: one of three alternative preliminary forms essential to the legal celebration of marriage in England. The other two are marriage by license (see SPECIAL LICENSE) and marriage by a registrar's certificate. The usage of B. has its origin in the ancient practice of the Rom. Cath. Church.—In the several states of the Union the laws do not require proclamation of intended marriage, the marriage license generally having superseded the banns: in some of the states, e.g. New York, not even marriage license is required. Each state exercises supreme jurisdiction over the marriage contracts and marriage relations and divorces of its citizens.—See MARRIAGE: REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES.

BANQUET, n. *bǎng'kwět* [F.—from *banque*, a bench or table: It. *banchetto*, diminutive of *banco*, a bench or table]: a feast; a rich entertainment; anything delightful: V. to feast; to treat with a feast. BAN'QUETER, n. one who. BAN'QUETING, imp.: N. the act of feasting. BAN'QUETED, pp.—SYN. of 'banquet, n.': feast; carousal; entertainment; treat.

BANQUETTE, n. *bǎng-kět'* [F.—from *banc*, a bank]: in fort., a raised ledge or way inside the parapet of a rampart, of such a height that musketeers, when standing on it, may be able to fire over the crest of the parapet without too much exposure to the enemy. It is about 4 ft. wide, and 4 or 4½ ft. below the crest. The musketeers ascend to it from the rampart either by a few steps or by a sloping path.

BANSHEE, n. *bǎn'shē* or BEN'SHIE [Gael. *ban-shith*—from *bean*, a woman; *sith*, a fairy]: in popular *myth.*, a kind of goblin, in parts of Scot. and Ireland, supposed to give notice of death in a family. See BENSHEE.

BANSWARRA, *bán-swá'rá*: Rajpoot state in the w. of Malwa, bordering on Guzerat; from n. lat. 23° 10' to 23° 48', and from e. long. 74° 2' to 74° 41'; 1,500 sq. m. This state was dependent on the empire of Delhi until the ascendancy of the Mahrattas, by whom it was fearfully oppressed. In 1812, the ruler made overtures to the British government, offering to become tributary on condition of protection; and an arrangement to this effect was concluded, 1818. Pop. (1881), 104,000; (1890) 144,000.

BANSWARRA: cap. of the state, is on the route from Mhow to Deesa; 123 m. n.w. from Mhow. The majority of the inhabitants are Hindus, but the Mussulmans also are

BANTAM—BANTRY.

numerous. The palace of the Rawul, or chief, is a large, turreted, battlemented building, on a rising ground overlooking the town, near a beautiful tank, overhung with trees.

BANTAM, *băn-tâm'*: seaport, now decayed, in the residency of Bantam, which forms the w. end of Java. It was the first Dutch establishment in Java (1602). The residency suffered greatly from the destructive sea wave following the eruption of Krakatau, 1883. Pop. of residency (1883). 571,503.

BANTAM, n. *băn'tăm*: a breed of small domestic fowls with feathered legs—probably from *Bantam* in Java, whence these fowls were first brought: ADJ., applied to the breed. The B. is remarkable for small size, being only about a pound in weight, and for a disposition more courageous and pugnacious than even that of a game-cock. A bantam-cock will drive to a respectful distance great dunghill-cocks five times its weight, and has been described as 'a beautiful example of a great soul in a little body.' There are several sub-varieties of the bantam. Most of them have the legs much feathered. The flesh and eggs are good, although the eggs are of course small; and the bantam lays well in winter. See FOWL.

BANTENG, *băn'těng* (*Bos Banteng* or *B. Sondaicus*)· species of ox (q.v.), native of Java and Borneo; which in color, shape, horns, and want of dewlap bears some resemblance to the gaur (q.v.) of India, 'but in the skeleton of the gaur, the sacrum consists of 5 vertebræ, and the tail of 19, while in the skeleton of the B. the sacrum consists of but 4 vertebræ, and the tail of 18.' The B. is black, with white legs. The hair is short and sleek, the limbs slender. The muzzle is sharp. The back rises into a high arch immediately behind the neck. The B. inhabits forests, and has been generally described as untamable.

BANTER, v. *băn'tér* [unknown, but probably originated as a slang word: F. *bander*, to bandy at tennis]: to joke with in words and in good-humor; to rally: N. wit at the expense of another. BAN'TERING, imp. BAN'TERED, pp. *térd*.

BANTING, n. *băn't'ing*: after *Banting*, the promoter of a system of diet by which fat people try to get thin.

BANTING SYSTEM: see OBESITY.

BANTLING, n. *băn't'ling* [corruption of Eng. *bandling*—from the *bands* in which the child was wrapped]: a young child; an infant.

BANTRY, *băn'trĩ*: seaport town in the s.w. of Cork co., Ireland, in a cove at the head of B. Bay, 44 m. w.s.w. of Cork. Mountains 933 ft. high rise behind the town. B. is a summer resort for tourists. Pop. (1881) 2,632; (1891) 2,921.—BANTRY BAY, deep inlet, 25 m. long, 3 to 5 m. wide, is one of the finest harbors in Europe; it has also three minor harbors perfectly sheltered.

PLATE 9.

Banyan
Baobab



Banyan Tree.



Baobab Tree.

BANTU—BANYAN.

BANTU, *băn'tô*: name given by ethnologists to a large group of languages, and to the peoples speaking them, in Africa. The B. races occupy most of Africa from about 6° n. lat. southward, except the country occupied by the Hottentots. They are broadly distinguished from the Negroes (q.v.), and are in three divisions. The eastern includes Kaffirs (q.v.) and Zulus (q.v.); and extends to the Galla and Somali country, the Swahili being the most northerly section. The central division comprises Betjuans (q.v.) or Bechuanas (Basutos, Barolong, etc.). To the western division belong the inhabitants of the w. coast from the Hottentot country to the Gulf of Guinea, the peoples of Benguela, Angola, Congo, Loango.

BANVARD, *băn'vârd*, JOHN: artist: 1820–91, May 16; b. New York. In early life he was a painter in Louisville, Ky., exhibiting his pictures on boats at the principal towns along the river. He began, 1840, a panorama of the entire Mississippi. In this arduous work he travelled in small open boats many thousand miles, making his preliminary sketches, and supporting himself by shooting game and exhibiting his pictures. The panorama, covering half a mile of canvas, was exhibited all over the United States. The art was not of high order, but his work was faithful and interesting. He afterward passed long periods in Europe, Asia, and Africa, painting many pictures which were exhibited. He published in magazines extensively, both prose and poetry, besides several vols. of fiction. B. painted *The Orison*, the picture from which the first American chromo was made.

BANXRING, *băngks'rîng* (*Tupaia*): genus of insectivorous quadrupeds, remarkably differing from the other *insectivora* (q.v.) in their habits, as they climb trees with the agility of lemurs or squirrels; remarkable also for their very elongated muzzle. They have soft glistening fur, and a long bushy tail. The few species known are all natives of the Indian archipelago.

BANYAN, or **BANIAN**, n. *băn'yăn* or *băn-yăn'* [so named from the *Banians* (q.v.), who used their shaded area as a market-place: Skr. *banij*, a merchant], (*Ficus Indica*): English (not a native) name for a tree of India, remarkable for its vast rooting branches; nat. ord. *Moracææ*. It is a species of FIG (q.v.); has ovate, heart-shaped, entire leaves, about five or six inches long; and produces a fruit of a rich scarlet color, not larger than a cherry, growing in pairs from the axils of the leaves. The branches send shoots downwards, which, when they have rooted, become stems, the tree in this manner spreading over a great surface, and enduring for many ages. One has been described as having no fewer than 350 stems, equal to large oaks, and more than 3,000 smaller ones, covering a space sufficient for 7,000 persons. The branches are often thronged with monkeys, birds, and enormous bats. The monkeys eat both the fruit and leaves. The vegetation of the B. seldom begins on the ground. The seeds are deposited by birds in the crowns of palms, and send down roots which embrace and eventually kill the palm. As the B. grows old, it breaks

BANYULS-SUR-MER—BAPAUME.

up into separate masses, the original trunk decaying, and the props becoming separate trunks of the different portions. The wood of the B. is light, porous, and of no value. The bark is regarded by the Hindoo physicians as a powerful tonic, and is administered in diabetes. The



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white, glutinous juice is used to relieve toothache, and also as an application to the soles of the feet when inflamed. Bird-lime is also made from it. Gum-lac is obtained in abundance from the B. tree. The B. tree is beautifully described by Southey in his poem, *The Curse of Kehama*. See BO TREE: PEEPUL.

BANYULS-SUR-MER, *bân-yèl'-sür-mair*: town of France, in the Pyrénées Orientales, with a fishing-port on the Mediterranean. The celebrated wines of Grenache and Rancio are produced in this district. Near the town are four old towers, one of which marks the division between France and Spain. B. was the immediate scene of many encounters between the French republicans and the Spaniards during the first French Revolution. Pop. (1891) 2,796.

BANYUWANGY, or BANJOUVANGY, *bân-yô-wân'gê*: important seaport town and military post belonging to the Dutch, on the e. coast of Java. It is a telegraph station on the Port Darwin line.

BAOBAB, n. *bā'ô-băb'* [native name]: a tree of Senegal, also called monkey-bread, one of the largest known trees—its products are useful and medicinal; the *Adansonia digitata*, ord. *Sterculiaceæ*. See ADANSONIA.

BAP, n. *bap* [Scot.]: a small loaf of wheaten bread; a roll of bread.

BAPAUME, *bâ-pôm'*: fortified town of France, dept. of Pas-de-Calais. A portion of the allied troops advanced to this place, 1793, Aug., after compelling the French to abandon their fortified position, and to retreat behind the Scarpe. Pop. (1881) 3,304; (1891) 3,291.

BAPHOMET—BAPTISIA.

BAPHOMET, *băf'o-mět*: a mysterious symbol, which was in use among the Templars. According to the oldest and most probable interpretation, the word is a corruption of Mahomet, to whose faith the members of the order were accused of having a leaning. The symbol consisted of a small human figure cut out of stone, having two heads, male and female, with the rest of the body purely feminine. It was environed with serpents, and astronomical attributes, and furnished with inscriptions mostly in Arabic. Specimens are in the archæological collections of Vienna and Weimar. Hammer, however, in his *Fundgruben des Orients*, derives B. from Gr. *baphè*, baptism; and *metis*, council or wisdom. He charges the knights with a depraved Gnosticism, and makes the word signify the baptism of wisdom—the baptism of fire; in short, the Gnostic baptism—a species of spiritual illumination, which, however, was interpreted sensually by later Gnostics, such as the Ophites (an Egyptian sect of the 11th c.), to whose licentious practices he declares them to have been addicted. This explanation is generally discredited.

BAPTA, n. *băp'ta* [Gr. *bapto*, to dip, to dye]: genus of moths of family *Geometridæ*. They are thin-bodied, and fly during the day. *B. bimaculata* is the White Pinion-Spotted, and *B. punctata* the Clouded Silver Moth.

BAPTISIA, n. *băp-tis'ia* [Gr. *bapto*, to dye]: genus of leguminous plants, ornamental as garden-flowers.

Among the indigenous species of N. Amer. are the Common Wild Indigo (*B. tinctoria*), yellow; the Blue False Indigo (*B. australis*), s. and w. United States, sometimes cultivated; the common prairie species (*B. leucophæa*), cream-color or greenish yellow; and two white-flowered species, *B. leucantha*, Ohio and s.w., and *B. alba*, Virginia and s. All have papilionaceous (pea-like) flowers, and the 3-fingered leaves blacken in drying. *B. tinctoria* has been used in making an inferior quality of indigo.

BAPTISM.

BAPTISM, n. *băp'tizm* [L. and Gr. *baptis'ma*—from Gr. *baptizō*, I dip, I submerge, I cleanse with dipping, I make clean with water—from *baptō*, I dip, I immerse]: the dipping in water, or sprinkling with water; a rite of sacred immersion, or ablution, commanded by Christ for those who, confessing him, enter on discipleship in his church. **BAPTISMAL**, a. *băp-tiz'māl*, pertaining to baptism. **BAPTIS'MALLY**, ad. *-lǝ*. **BAP'TIST**, n. one of a religious sect which opposes infant baptism. **THE BAPTIST**, John the Baptist of Scripture. **BAPTIZE**, v. *băp-tiz'* [OF. *baptiser*—from mid. L. *baptizārē*, to baptize]: to administer the rite of baptism; to christen. **BAPTIZ'ER**, n. one who baptizes. **BAPTIZ'ING**, imp. **BAPTIZED**, pp. *băp-tizd'*. **BAPTIZABLE**, a. *băp-tiz'ă-bl*, that may be baptized. **BAPTISTERY**, n. *băp'tis-tér'ǝ*, a place for baptizing. **BAPTISTIC**, *băp-tis'tik*, or **BAPTIS'TICAL**, a. *-tǝ-kāl*, pertaining to baptism. **BAPTIS'TICALLY**, ad. *-lǝ*.

BAPTISM: a rite of Christ's church, ordained by Christ himself for those who enter on discipleship in his church: see Matt. xxviii. 19; Mark xvi. 16. B. is frequently mentioned in the New Testament as a divine ordinance, and is almost universally acknowledged as such among Christians; being commonly termed a 'sacrament,' though that term is never in the New Test. applied either to it or to the Lord's Supper (see **SACRAMENTS**). The principal passages in the New Test. in which B. is described are as follows: Matt. xxviii. 18-20; Mark xvi. 16; John iii. 26; Acts ii. 38, x. 44, *ff.*, viii. 16, xix. 1, *ff.*, xxii. 16; Rom. vi. 4; I Cor. i. 14-16, vi. 11; Eph. v. 26; Col. ii. 12; Heb. x. 22, 23. From these texts it is learned that B. is specially connected with the gift of the Holy Spirit, with the forgiveness of sins, with our being buried with Christ; and they teach by whom B. is to be administered, and who are the proper partakers in the ordinance. The accepted doctrine of B. has been formed by an arrangement and comparison of the conceptions in these texts. While the New Test. contains all that is essential toward establishing the origin and meaning of B., theologians have attempted to trace analogies to the rite in Old Test. and even in Pagan history.

The name and the rite were not altogether new when the ordinance was instituted by Christ. Religious meanings were early attached to washings with water, both by heathens and by Jews; they were among the ordinances of the Jewish law; and it is not necessary to go beyond that law to find the origin of the custom of washing or *baptizing* proselytes upon their admission into the Jewish Church. Washing with water was requisite for the removal of ceremonial uncleanness, and every proselyte must have been regarded as, prior to his admission into the Jewish Church, ceremonially unclean. John the Baptist baptized not proselytes upon their renouncing heathenism and entering the Jewish Church, but those who, by birth and descent, were members of it, to indicate the necessity of a reformation, purification of the soul from sin—a spiritual, and not a mere outward change.

One of the most important of the controversies which

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have agitated the Christian Church as to B., is that concerning the proper subjects of B., whether adults only who profess faith in Christ are to be baptized, or whether this ordinance is to be administered to their infants also. See BAPTISTS: BAPTISM, INFANT. The B. of adults was certainly more frequent in the apostolic age than it has ordinarily been where the B. of infants has prevailed; for which an obvious cause presents itself in the fact that the first members of churches were converts from Judaism or from heathenism. It is, however, generally held by those who advocate the B. of infants that it was the practice of the apostles and of the church of the apostolic age to baptize the infants of Christians; which, on the other hand, is stoutly denied, and infant B. is alleged to have crept in with other corruptions.

Both the practice of infant B., and the neglect of it in the early ages of the church, were connected with particular views of religious doctrine, and of the nature and purpose of B. itself. The prevalence of the Augustinian doctrine of original sin is generally regarded as a principal cause of the prevalence of infant B.; but Pelagius, while opposing that doctrine, maintained the necessity of infant B., apparently upon the ground that the kingdom of heaven can be attained by human beings only through God's grace. No little influence in favor of infant B. must be ascribed to the growing belief of the absolute necessity of B. to salvation, and of a sort of mysterious efficacy in the rite itself. But, on the other hand, it is certain that the belief in the forgiveness of sins in B. led to a practice of deferring it as long as possible, that all sins might be blotted out at once; thus the Emperor Constantine the Great was baptized only a short time before his death. The approach of a war or pestilence caused many to rush forward in haste to be baptized, who had previously delayed.

Two modes of B. are practiced: by immersion or dipping, and by aspersion or sprinkling, concerning which there has been much controversy in the early period of the church's history, as well as in recent times. Affusion, or pouring, the common practice of the Church of Rome, may be regarded as essentially the same with sprinkling. The advocates of sprinkling universally admit the validity of B. administered in the other mode, but the advocates of dipping generally refuse to acknowledge that B. by sprinkling can be true Christian baptism. The opponents of infant B., almost without exception, insist upon immersion; while aspersion or affusion of water is general, except in the Eastern churches, wherever the B. of infants prevails. The argument upon which Baptists depend most of all is from the word B., and the verb *baptizo*, to baptize, which also, in classic Greek, signifies to immerse. On the other side, it is contended that a strict limitation to this sense does not well accord with its character as a 'frequentative' form of *bapto*; and instances are adduced from the New Testament itself, in which this signification cannot easily be attached either to the noun or to the verb,

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as 1 Cor. x. 2, where Paul says that the Israelites were 'baptized unto Moses in the cloud and in the sea;' and Heb. ix. 10, Mark vii. 4, and Luke xi. 38, where both verb and noun are employed concerning the *washings* of the Jews, and the noun even concerning their washing of 'cups, and pots, brazen vessels, and of tables.'—To the argument in favor of immersion, derived from the phrases employed when B. is mentioned in Scripture, as when we are told (Mat. iii. 6) that John the Baptist baptized 'in Jordan,' that our Lord after his B. (Mat. iii. 16) 'went up out of the water,' that Philip and the Ethiopian eunuch (Acts viii. 38) 'went down both into the water;' it is replied that all the passages of this description, even if their meaning were certainly as precise and full as baptists suppose it to be, are insufficient to sustain the weight of the conclusion as to the necessity of a particular mode of B.; that, however, it is far from being clear that these passages must be interpreted or the meaning of the Greek prepositions so strictly defined as the argument requires; and further, that there are instances mentioned in Scripture which afford a presumptive argument in favor of another mode of B., as where we are told of great numbers added to the church in one day; while we have nowhere any intimation of converts being led to any pond or river to be baptized. It is also pointed out that in the warm oriental countries, where garments were not close-fitting, but flowing and easily movable, a going down 'into the water' by both baptizer and baptized, and a standing in it up to the knees, would afford the most convenient and natural arrangement for administering *affusion*, if that were the mode. To the argument drawn from the language of Paul in Rom. vi. 4, Col. ii. 12 (see BAPTISTS), it is replied that it depends upon a fanciful interpretation of these texts.—According to most of the advocates of B. by sprinkling, the great error of their opponents is that of attaching too much importance to the question of the mode of baptism, a question of an outward form.

Whatever may be the meaning of the Greek verb *baptizo*, or whatever the binding force on the church of all lands and ages of the outward modes of observance among the primitive Christians in the Orient, it is indisputable that in the primitive church the ordinary mode of B. was by immersion. But B. was administered to sick persons by sprinkling, though with evident doubts as to its efficacy (middle of 3d c.). Baptism by sprinkling gradually became more prevalent; but the dispute concerning the mode of B. became one of the irreconcilable differences between the Eastern and Western churches, the former generally adhering to the practice of immersion, while the latter adopted mere pouring of water on the head, or sprinkling on the face, which practice has generally prevailed since the 13th c.; but not universally, for it was the ordinary practice in England before the Reformation to immerse infants, and the *fonts* (q.v.) in the churches were made large enough for this purpose. This continued also to be the practice till the reign of Eliza-

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beth; and the change which then took place is ascribed to the English divines who had sought refuge in Geneva, and other places of the continent, during the reign of Mary. To this day the rubric of the Church of England requires, that if the godfathers and godmothers 'shall certify him that the child may well endure it,' the officiating priest 'shall dip it in the water discreetly and warily;' and it is only 'if they shall certify that the child is weak,' that 'it shall suffice to pour water upon it,' which, however, or sprinkling, is now the ordinary practice.

B. was accompanied, from an early period in the history of the church, with various forms and ceremonies, besides the simple rite of washing with water and the pronouncing of the formula which declares it to be 'in (or into) the name of the Father, and of the Son, and of the Holy Ghost.' These ceremonies almost all are retained in the Church of Rome, also generally in the oriental churches, but have been almost entirely laid aside by Protestants. The Church of England, and the Prot. Episc. Church in this country, retain the sign of the cross made upon the forehead after B., but the other Prot. churches reject it. It was an ancient custom that the *catechumens*, as candidates for B. were called while receiving instruction, when they were to be baptized, publicly made a profession of their faith and a renunciation of the devil and all his works. The profession of faith is still retained by Prot. churches as the formal ground of the administration of B.; the renunciation of the devil and his works is required by the Church of England, and by the Prot. Episc. Church, of the person baptized, if an adult, or of the *sponsors* or 'sureties' of a child. Sponsors (q.v.) were early admitted to answer for those who could not answer for themselves, and particularly for infants. The belief in the absolute necessity of B. to salvation led even to B. of the dead among the Montanists in Africa, in which sponsorship also was introduced. Congl. and Presb churches generally reject all sponsorship, and regard the profession made by parents as simply a profession of their own faith, which entitles their infants to baptism. The ancient practice of exorcism (q.v.) immediately before B., has been rejected as superstitious by almost all Protestant churches; as have also that of immersing three times (*trine immersion*), or sprinkling three times, with reference to the three persons of the Godhead—that of breathing upon the baptized person, 'to signify the expulsion of the devil,' and to symbolize the gift of the Holy Spirit—that of anointing with oil (*chrism*, q.v.), to symbolize the same gift, or to indicate that the baptized person is ready, as a wrestler in the ancient games, to fight the good fight of faith—that of giving him milk and honey, in token of his spiritual youth, and of his reception of spiritual gifts and graces—that of putting a little salt into his mouth, to signify the wisdom and taste for heavenly things proper to a Christian—that of touching his nostrils and ears with spittle, to signify that his ears are to be ever open to truth, and that he should ever feel the sweet odor of truth and virtue—and

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that of clothing him after B. with a white robe (the *chrysome*), in token of the innocence of soul which by B. he was supposed to have acquired. The white robe and the anointing with oil were retained in the Church of England for a short time after the Reformation.—The giving of a name in B. (see the article NAMES) is no essential part of it, but is a custom apparently derived from that of the Jews in circumcision (Luke i. 59-63).—The Church of Rome prefers the use of holy water (q.v.) for B., but regards any water as fit for the purpose in case of necessity.—According to an ancient usage, long obsolete, the ordinary administration of B. was limited to the two great festivals of Easter and Whitsuntide or Pentecost.—Whether B. may be administered in private, has been much debated, both in ancient and modern times. The administration of B. in private houses, and not in the presence of a congregation, was one of the things earnestly contended against by the Presbyterians in Scotland in the first half of the 17th c.; their opposition being grounded, not only upon hostility to what they deemed usurpation of authority, but upon the danger of superstitious views of baptism. And apparently upon this latter ground, B. in private houses is also discouraged, even while it is allowed, if there is ‘great cause and necessity,’ by the Church of England; yet it has become frequent both in the Episcopal and the Presbyterian churches.

For some of the most important questions concerning B., particularly those relating to its place in the Christian system and among the means of grace, see SACRAMENTS. The opinions early became prevalent, that forgiveness of sins is obtained in B., and spiritual life begun, and that it is indispensably necessary to salvation—exception being made, if any was made at all, only in the case of adult believers, who, desiring B., were prevented from being baptized, and particularly those who suffered martyrdom, which was generally held to be equivalent to baptism. The Church of Rome still owns, as supplying the place of B. by water, these two—B. by desire; and B. by blood—i.e., in martyrdom.—According to the general doctrine of the Protestant churches, B. is a ‘sign and seal’ of the covenant of grace, representing as a sign the blessings of the covenant, and as a seal confirming the covenant. As a sign, it is generally held to represent, in its rite of washing, the removal both of guilt and corruption, by the blood and by the Spirit of Christ, and so to relate equally to pardon and regeneration, although some have limited its symbolic reference to regeneration alone. One of the most important points disputed concerning B. is that of baptismal regeneration. See REGENERATION.

Some early Christian sects appear to have rejected B., on grounds somewhat similar to those on which it is now rejected by the Quakers or Friends (q.v.), who explain symbolically the passages which relate to it, and insist that spiritual B. is the only real B. of Christians.—The Socinians also in modern times have maintained that B. is not an ordinance of permanent obligation, but a merely symbolical rite of little importance.

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Much controversy has taken place concerning *Lay Baptism*. Wherever there is a recognized ministry in the church, there is a general agreement in referring the ordinary administration of B. to those who hold this office. It might be expected that the more strongly the necessity of the transmission of *holy orders* by apostolical succession is asserted, the more strongly also would exclusiveness be manifested with regard to the right of the *clergy* to administer B. But this tendency is counteracted by the belief in the necessity of B., or at least of its great importance to the salvation of infants; so that from an early period, in cases of apprehended danger, lay B. was allowed, although not without a struggle; and in the Church of Rome, this principle is logically carried out to the fullest extent, so that even women are authorized to administer B. in cases of necessity. On the same ground, lay B. was at first permitted in the Protestant Church of England; but the prevalence of other views led to a kind of formal restriction of the right of administering it to 'lawful ministers,' although in practice the validity of lay B. is still generally recognized.

Another question much agitated in the church from early times, is that concerning the validity of B. by heretics. The opinion ultimately prevailed, that B. by heretics is valid, except in the case of those who do not baptize in the name of the Father and the Son and the Holy Spirit. The continues the almost universal opinion. Few Protestant theologians hesitate to acknowledge the validity of B. administered in the Church of Rome.

The *B. of bells* is a custom supposed to have been introduced about the 10th c., and still retained in the Church of Rome. The term *benediction* is sometimes substituted for B.; but the rite itself is very similar to that of B., and is accompanied with many similar ceremonies—'a sort of exorcism,' sprinkling with holy water, anointing 'with the oil of catechumens' and 'with chrism,' a formula of consecration 'in the name of the Father, Son, and Holy Ghost,' and sometimes also, if not always, the giving of a name to the bell consecrated, and even a kind of sponsorship as by godfathers and godmothers in baptism. This custom has no doubt greatly fostered the notion of an efficacy in the ringing of bells for protection in storms, and for other benefits; indeed, it is expressly avowed that 'the bells are blessed, to turn off storms and tempests from the faithful.'

Note.—The remainder of this article—prepared by an eminent Baptist preacher and writer—presents the position of Baptists on this subject.

BAPTISM.—The family of Greek words relating to B. springs from the root word *baptizein*, which term was in such common use in Greek literature that a complete monograph of the word brings to light 168 distinct instances in the period B.C. 200—A.D. 1,000. Its ground meaning in all these cases is, 'to immerse, immerge, submerge, to dip, to plunge, to imbathe, to whelm.' This, Donegan, Liddell and Scott, and the other great lexicographers uniformly maintain. As a divine ordinance, B. was unknown among the Jews until

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the time of Christ, when he introduced it as a divine appointment 'from heaven,' by the use of which all his disciples were to be initiated into his church. Much has been written about the ablutions of the Old Testament, and the inference has been drawn that, before Christ, proselytes to the Jewish faith were inducted into that faith by B. The Jews, indeed, observed various symbolical lustrations, but they all were merely ceremonial, and, as Josephus expresses it, these were 'of their own will, without direction of the Lord.' 'Divers washings' were indeed enjoined by the law, but none of these had in view the ends and objects of B. Von Rohden says: 'The washings enjoined by the law had for their object purification from ceremonial defilement; but the B. of John did not; the one rite was performed by themselves upon their own persons; the other was administered to its recipient by the Baptist himself, or by one of his disciples properly authorized: the former was repeated upon every occasion of renewed defilement; the latter was performed upon the candidate once for all. The two ceremonies, therefore, were essentially different in their nature and object.' No lustrations were done under the Old Testament customs in the name of the Trinity, but the Lord Jesus enjoined this great sanction in B. High scholarship has shown that, instead of Christian B. having been borrowed from the Jews, the reverse is true, and that Jewish proselyte B. was incorporated into Judaism, in imitation of the Christian practice, as late as A.D. 70, after the destruction of Jerusalem. The first witness in favor of this Jewish observance is found in the *Commentary of the Talmud*, composed not before the 5th c. after Christ. Geikie well says: 'Bathing in the Jordan had been a sacred symbol at least since the days of Naaman; but immersion by one like John, with strict and humbling confession of sin, sacred vows of amendment, and hope of forgiveness if they proved lasting, and all this in preparation for the Messiah, was something new in Israel.' And Godet teaches the same truth when he writes: 'The rite of baptism, which consisted in the plunging of the body more or less completely into water, was not at this period in use among the Jews, neither for the Jews themselves, for whom the law prescribed only lustrations, nor for proselytes from paganism, to whom, according to the testimony of history, baptism was not applied until after the fall of Jerusalem. The very title, *Baptist*, given to John, sufficiently proves that it was he who introduced this rite.'

After the Lord Jesus himself had received B. at the hands of John, and the Baptist had borne witness to his Messiahship, he established his own church and appointed B. as the method of admission into it. His apostles obeyed His injunction, and during the apostolic age many thousand of believers, both men and women, were received in this way into the churches. The administration of the ordinance took place in the Jordan, and in pools and fountains of the great city of Jerusalem, which had the fullest supply of water of any of the Palestinian cities. Lieut. Lynch, of the U. S. navy, made a topographical exploration of the

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Jordan, and gives it as his opinion, with Pococke and others, that the river discharges about 6,000,000 tons of water into the Dead Sea daily. Dr. Philip Schaff says that he found the Jordan, at the reputed place of Christ's B., to be 80 ft. broad and 9 ft. deep. In treating of Jerusalem, all historians set forth the number and value of its immense stores of water for public use. In all its calamities by siege and famine, it never suffered for want of water. Its natural springs had much to do with the selection of its location, so that its water-wealth was gathered into wells, pools, and reservoirs in a fullness which marked no other capital. A large supply was indispensable for its domestic purposes, but its religious demands were much more exacting. Josephus tells us that at the Passover it was visited yearly by hundreds of thousands of pilgrims; and that at this feast 200,000 beasts were sacrificed, the washing of which sacrificial victims called for immense supplies of water. Much unworthy speculation has been indulged in regard to the supply of water and of administrators for the immersion of the 3,000 converts to Christ at Pentecost. Dean Plumptre, with characteristic candor, says: 'The largeness of the number has been urged as rendering it probable that the baptism was by affusion, not immersion. On the other [hand] (1) immersion had clearly been practiced by John, and was involved in the original meaning of the word, and it is not likely that the rite should have been curtailed of its full proportions at the very outset; (2) the symbolic meaning of the act required immersion in order that it might be clearly manifested, and Rom. vi. 4, and I Peter, iii. 21, seem almost of necessity to imply the more complete mode. The pools of Bethesda and Siloam (see John v. 7; ix. 7), or the so-called Fountain of the Virgin, near the temple inclosure, or the bathing places within the Tower of Anthony (Jos., *Wars*, v. 5, § 8), may well have helped to make the process easy.' The number of administrators, the 'Twelve' and the 'Seventy,' making 82 in all, answers all questions as to the possibility of the event. At Velumpilly, in India, 1872, July 3, 2,222 persons were deliberately immersed on confession of their faith, by six administrators, in eight hours. Farrell, in his *Life of St. Patrick*, records that he and his assistants immersed seven kings and 11,000 of their subjects in one day; Remigius immersed Clovis I. and 3,000 of his warriors in one day; and 598, Apr. 20, Austin and his assistants immersed 10,000 believers, in the river Swale, in one day.

According to the best evidence now at command, the converts to Christ, Jews and Gentiles, who had been baptized, at the close of the 1st c., numbered about 500,000; and there was very little change in any respect in the doctrine of B. till about A. D. 200, when several useless ceremonies began to steal into this simple rite. Among these was the use of the sign of the cross, not only in B., but it became a general habit, on rising in the morning and retiring to rest at night, on taking the bath or sitting down to meals. The churches also began to confine B. to the festivals of Easter and Pentecost, to anoint the candidate with oil after

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B., and to give him salt and honey, in token of his new life as a Christian. Soon after this the theory of baptismal regeneration crept into Christian teaching, so that B. began to be spoken of as a 'regeneration,' as a 'seal' which bound a man to Christ with the effect of an oath, and as an 'illumination,' confounding it with the work of the Holy Spirit. Tertullian (160-240), in his work *De Corona* (c. iii.), takes pains to describe the B. of his day thus: 'A little before we enter the water, in the presence of the congregation, and under the hand of the president, we make a solemn profession that we renounce the devil, his pomp, and his angels. Upon this we are *thrice* immersed, making a somewhat ampler pledge than the Lord has appointed in the Gospel. When we come up out of the water, there is given us a mixture of milk and honey, and we refrain from the daily bath for a week.' This 'ampler pledge' refers to trine immersions instead of the one dipping; and their abstinence from the 'bath for a week' arose from the new superstition that they might wash off the baptismal water and oil, and so, to some extent, lose the salutary effect. Late in the 2d c. it had become necessary, in the judgment of the churches, to immerse three times, at the mention of the several names of the Godhead, as is abundantly shown by Coleman, Guericke, Neander, Reuss, Kuntz, Weiss, Schaff, Döllinger, Farrar, Conybeare and Howson, Stanley, and many others. Dean Stanley, in his *Eastern Church* (p. 117), sums up the case in these words: 'There can be no question that the original form of baptism—the very meaning of the word—was complete immersion in the deep baptismal waters; and that for the first four centuries, any other form was either unknown, or regarded, unless in the case of dangerous illness, as an extremely exceptional case. To this form the eastern church still rigidly adheres; and the most illustrious and venerable portion of it, that of the Byzantine empire, absolutely repudiates and ignores any other mode of administration as essentially invalid. The Latin church, on the other hand, doubtless in deference to the requirements of a northern climate, to the changes of manners, to the convenience of custom, has wholly altered the mode, preferring, as it would fairly say, mercy to sacrifice; and (with the two exceptions the Cathedral at Milan and the sect of the Baptists) a few drops of water are now the Western substitute for the threefold plunge into the rushing rivers, or the wide baptisteries of the East.

Some time in the 5th c. the repulsive practice sprang up of immersing the candidate in a state of nudity. Christians came to the absurd belief that B. purified the body as well as the soul from all moral taint, so that, if the baptismal waters did not touch every part of the body, leprous spots might be left. Dr. Wall believed that the ancients put off all clothing to represent the putting off of the old man; and Cave gives the same interpretation when he says: 'They were brought to the font and were first stripped of their garments, intimating their putting off the old man which is corrupt with his deceitful lusts.'

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The cases of B. in 'dangerous illness' in any other form than immersion (designated by Dean Stanley as almost 'monstrous' cases) were known as 'clinic B,' the B. of the bed, and the practice came in, so far as is now known, in the following way: About 281, Novatian was supposed to be dying, but was unbaptized; and so alarm seized his friends, who believed that no man could be saved who died in that condition. His illness would not allow him to be immersed thrice, but something must be done to save him, and in haste. Hence, while stretched upon his supposed bed of death, water was poured in an outline all around his person, inclosing his entire body from head to foot, and was then poured all over him, till he was drenched, making perfusion as near immersion as possible, with the understanding that if he died, this was to stand for B., but if he lived, his B. was to be accounted defective. He lived; and Cornelius, bp. of Rome, wrote to Fabius, bp. of Antioch, complaining of such a shocking innovation. Eusebius, Crusé, Vales, and Cave have treated at great length of this first recorded instance of departure from immersion, and Cyprian rebuked the early Christians for calling such converts Clinics, 'a nickname, which,' he said, 'had been fixed upon those who had been perfused upon their beds.'

In the history of Christianity, fierce and constant controversy has arisen around this subject—as to its method, its subjects, and its purposes. The Friends deem it a superannuated form, and the Rom. Catholics as regeneration itself, while others attribute to it the power, in some form, to wash away sins. The Holy Scriptures are very simple in defining its relation to other forms of Christian truth: see Col. ii. 2; Rom. vi. 4. Cardinal Pullus, 12th c., gave the substance of all scholarship and history on this point, when he said (*Eccles. Hist.*, vi. 43): 'Whilst the candidate for baptism in water is immersed, the death of Christ is suggested; whilst immersed and covered with water, the burial of Christ is shown forth; whilst he is raised from the waters, the resurrection of Christ is proclaimed.' And Dr. Döllinger sums up the whole early account of the method in these words: 'Immersion of the whole person; which is the only meaning of the New Testament word—a mere pouring or sprinkling was never thought of.' For many centuries all innovations on the apostolic method of administering B. were sternly resisted, and so aspersion and other forms were of very slow growth, for council after council declared against these changes. The first council which gave them countenance was that of Ravenna, 1311. In 1200 the council of London enjoined immersion, that of Sarum 1217, and that of Oxford, 1222, did the same; and the synod of Worcester, 1240, passed the decree: 'Let the candidate for baptism always be immersed.' Arthur, brother of Henry VIII., and Margaret, his sister, were immersed 1486 and 1502. Edward VI. and Queen Elizabeth were 'buried in baptism,' in like manner. The council of Calichyth (Chelsea), 816, passed this canon: 'Let the presbyters know when they administer sacred baptism,

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not to pour holy water upon the heads of the infants, but always to immerse them in the laver, after the example given by the Son of God himself, when he was three times immersed in the waters of Jordan.' As late as the reign of Edward VI., his prayer-book (1549) enjoined that the priest shall 'take the child in his hands and shall dip it in the water thrice. First dipping the right side: second the left side: the third time dipping the face.' The present Anglican prayer-book requires the priest, unless he be certified that the child is weak, to 'dip it' (the child) 'in the water discreetly and warily;' and the Prot. Episc. prayer-book requires him 'to dip it in the water discreetly,' or to 'pour water upon it.' No writer has put the matter into fewer words than Brenner, the great Rom. Cath. writer, in his *Historical Exhibition of Baptism*, p. 306. He says: 'Thirteen hundred years was baptism generally and regularly an immersion of the person under the water, and only in extraordinary cases a sprinkling or pouring with water; the latter was, however, disputed as a mode of baptism, nay, even forbidden.'

BAPTISM, INFANT: the introducing of little children into the church by Baptism (in one view); the application of the initiatory rite of the Christian covenant to the children of believing parents (another view); a form of dedication of little children to God by their parents, both in testimony and as a vow of parental faith and purpose concerning them (another view). The chief arguments in favor of infant B. are based upon the proposition that the church is one throughout all changes of dispensation. From this it is argued that as, under the Old Covenant, the children of God's people were dedicated to God in the initiatory rite of the church, so are they to be in the initiatory rite which pertains to the New Covenant; and by many the stronger statement is maintained, that such infants are members of the visible church; while some go no farther than to assert that such infants are received into the spiritual care of the believing church (Lk. ix. 48). It is maintained that in all covenants which God has made with men, their children have been included with their parents; that the covenant with Abraham was a renewed revelation of the covenant of grace, the temporal promises made to him being connected with the greatest spiritual promises; that circumcision was a seal of the covenant with respect to these, in which the children of Christians have the same interest that Jewish children had; and that B. is a sign and seal of the covenant now as circumcision was, the things to which it has immediate reference being also blessings which children are capable of receiving. It is contended that to give little children such a place in the church strengthens the argument for their salvation. The passages which connect B. with faith are regarded as relating only to adults, like the passages which connect salvation with faith and repentance. To the argument that there is no express command for infant B., it is replied that the case rather demands of those who oppose it the production of an express command against it, without which the general

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command must be held to include it; the words and actions of Christ (Mk. x. 14) are quoted as indicating the place of infants in his church as it had been under the Jewish dispensation; and it is contended that it would have been a great restriction in the new dispensation if infants had been excluded from their former right to the sign and seal of the covenant, whereas the new dispensation is characterized not by restriction but by enlargement of privilege.—Those who hold the doctrine of infant B. are styled Pedobaptists. An increasing number of those who claim their liberty to practice infant-B. deny the right of any church to *require* it, since the New Test. gives no command concerning it.

The Rom. Cath. and Luth. churches regard the B. of infants as admitting them into the church, and making them members of Christ's body. The Reformed (q.v.) churches largely hold that the children of Christians are included in the visible church from their birth, and therefore entitled to B. These are the natural starting-points of very different systems. There is also the view that all human infancy and childhood are redeemed in Christ, so that all infants are eligible to B.—losing the benefits of this redemption only when growing up into free-will they turn away into ungodliness. See BAPTISM: BAPTISTS: SACRAMENT.

The following—prepared by an eminent Baptist preacher and writer—presents the Baptist position on this subject:

INFANT BAPTISM.—The unanimity with which the most able Christian scholars declare that infant B. has no place in the Sacred Scriptures is noteworthy. Bunsen writes (*Hyppol.* iii. p. c. 180): 'It was utterly unknown in the early church, not only down to the end of the 2d, but, indeed, to the middle of the 3d c.' Hahn testifies that 'neither in the Scriptures nor during the first 150 years is a sure example of infant B. to be found, and we must concede that the numerous opposers of it cannot be contradicted on Gospel ground' (*Theol.* p. 557). Curcellæus declares that 'the baptism of infants in the first centuries after Christ was altogether unknown; but in the 3d and 4th was allowed, by some few. In the fifth and following ages, it was generally received. The custom of baptizing infants did not begin before the third age after Christ was born. In the former ages no traces of it appear, and it was introduced without command of Christ' (*Inst.*, I. c. xii.). Dr. Jacob says: 'Notwithstanding all that has been written by learned men upon this subject, it remains indisputable that infant baptism is not mentioned in the New Testament. No instance of it is recorded there; no allusion is made to its effects; no directions are given for its administration. However reasonably we may be convinced that we find in the Christian Scriptures "the fundamental idea from which infant baptism was afterward developed," and by which it may now be justified, it ought to be distinctly understood that it is not an apostolic ordinance' (*Eccl. Polity N. T.*, p. 270). Any guileless investigator of Scriptural duty and authority might naturally say: 'Then, without the author-

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ity of Christ or his apostles, it must fall to the ground.' Yet writers of no mean name defend its right as being not *forbidden* in the New Test.; but Baptists, while conceding every man's liberty of judgment, reply: If silence gives consent, and consent imposes duty, there can be no end to these admixtures in the Christian system.

The chief arguments in favor of infant B. are based on the proposition that it is substituted in the place of Jewish circumcision. The difficulty in admitting such a position lodges in these facts: 1. That circumcision admitted men into all the rights, privileges, and immunities of citizenship in a nation; while, under Christianity, a man possesses all these without B., which admits him only to certain religious distinctions, and which are not inalienable. 2. Infant B. subjects all females to its sway, while circumcision bound its 'yoke' only on the other half of mankind. 3. In the Christian churches, Jews who had been circumcised were baptized as well as Gentiles who had not. 4. The Lord Jesus, Paul, Timothy, and thousands of others in the Gospel churches, were both baptized and circumcised, showing that the one rite did not take the place of the other. 5. The Jewish male had a natural right to circumcision, while the Gentile had no natural right to either circumcision or B., and could have no natural interest in either of these ordinances aside from purely religious privilege. He could claim B. only, on the ground that he was 'a new creature in Christ Jesus,' not being able to show any demand on parental faith or federal relationship with Christ, and he was baptized on his own volition, having chosen Christ as his Saviour.

Clearly, the Lord Jesus instructed his apostles whom to baptize, and on what conditions, but went no further. God commanded Abraham to circumcise his own sons, but he did not practice this rite on other men's sons, nor did he insist on practicing the rite on other men's sons, because he was not forbidden to do so. The baptized of the New Test. are spoken of as 'disciples,' 'saints,' 'believers,' 'elect;' and their state of mind has nothing to do with family, or parentage, or blood, but is simply that of 'faith,' 'obedience,' 'remission of sins,' and 'enduring hardness as good soldiers of Jesus Christ,' qualities which cannot be ascribed to infants, whether or not they be circumcised or baptized. The Lord Jesus made the most gracious provisions for the eternal salvation of children, outside of both baptism and the Lord's Supper, neither of which they were capable of discerning. They could bear no moral yoke, and he put none on their necks, but provided redemption for them without conditions of any sort. Parents craved his 'blessing,' not his B., for their children; and he 'blessed them,' without baptizing them, as Jacob blessed his grandsons, and after 'praying' for them, he pronounced them 'of the kingdom of heaven.'

Infant B. found little favor in the primitive churches, till men began to associate the purging of the soul from original sin with the act of B., and even then it was long and forcefully resisted. Tertullian denounced it stoutly;

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and as a doctrine it found no place in Christian theology till Augustine invoked it against Pelagianism. Down to his time, there was in the churches no liturgy for the B. of infants, and Adrianus of Corinth refused to baptize them. But, in order to silence all opposition to the practice, the council of Carthage (can. ii), 397, pronounced 'an anathema against such as deny that children ought to be baptized as soon as they are born;' and the council of Milevium 416, decreed that, 'Whosoever denies that new-born infants are to be baptized, to the taking away of original sin—let him be anathema.' By the 9th c. the practice had overcome all opposition, and become almost universal. Toward the close of the 6th c. the state interfered, and fees were collected for its administration, and often the charges became so enormous that the poor could not pay them. Yet, lest their children should die unbaptized and perish, they strained every nerve to secure their B. Charlemagne enacted that all infants should be baptized before they were a year old, a nobleman being fined for neglect 120 shillings, a gentleman 60, others 30. As a sheep was sold for a shilling in those days, a poor man must sacrifice his whole flock, and a nobleman 120 sheep, if he neglected to bring his babe to the Christian state-fold. The Northumbrian law, 950, said: 'Let every infant be baptized within nine days, upon pain of six *oves*; and if the infant die a pagan within nine days, let his parents make satisfaction to God without any earthly mulct; if after he is nine days old, let them pay 12 *oves* to the priest besides.' Most forcibly does Schaff declare, that all this was 'unknown before the ante-Nicene age,' and so pronounces it 'a profanation of the sacred event, and one of the evils of the union of church and state, against which Baptists have a right to protest.'

There cannot be a more frightful dogma than that which avows that unbaptized infants should be doomed after death, and it is a matter for thanksgiving that so high an authority as Justin Martyr should say of the early churches: 'We were born without our will, but we are not to remain children of necessity and ignorance, but in baptism are to have choice, knowledge, etc., . . . this we learned from the Apostles' (*Second Apol.* p. 93). His biographer says, 'Of infant B. he knows nothing.' Nothing is more astonishing in connection with this theme than the fact that some of the most stubborn advocates of infant B., e.g. Augustine, were never submitted to its demands. Monica, his mother, was one of the holiest women in history, and labored hard to bring him to Christ, but he was not baptized till he brought with him his own son, at the age of 14 years, the child of a concubine; and Ambrose did not baptize Augustine till he had reached the age of 32 years. Ephraem, the great hymnist of Edessa, supposed to be the son of martyr parents, was not baptized, though educated by Bishop Jacob of Nisibis, till his 18th year. The father of Jerome was a Christian, but Pope Liberius did not baptize him till about his 20th year. The father of Gregory Nazianzen was a bishop, but Gregory was not baptized till his 30th year. The forefathers of Basil of Cap-

BAPTISM OF JESUS CHRIST—BAPTISTE.

padocia had been Christians for generations, but he was not baptized till his 27th year; and Chrysostom, of the golden mouth, reached the age of 30 before his B. Schleiermacher puts the whole subject into a nutshell, in these words: 'The Roman apostolic practice thoroughly agrees in demanding beforehand a beginning of faith and repentance; as all traces of infant baptism that men have wished to find in the New Testament must first be put into it; it is, in view of the lack of definite information, difficult to explain how this departure from the original institution could have originated and established itself so widely' (*Der Christliche Glaube*, II., p. 383).

BAPTISM OF JESUS CHRIST, REPRESENTATION OF: the baptism of Jesus by St. John is one of the events in the life of the Messiah most frequently represented by artists. It has been from the earliest times of Christian art the most common ornament of baptisteries, and to this day it is painted or sculptured in most of the chapels where baptismal fonts are placed. One of the most ancient representations of the baptism of Christ is a picture published by Bottari and Buonarotti, and believed to be of the 6th c. It represents Jesus immersed to his waist, and the dove flying above his head; John is upon the bank and pours water upon the head of Christ. This principal group is accompanied by allegorical representations, Moses causing the water to come out of the rock, and the multiplication of the loaves. M. Martigny thinks the latter scene expresses beautifully the multiplication of the children of God by baptism.

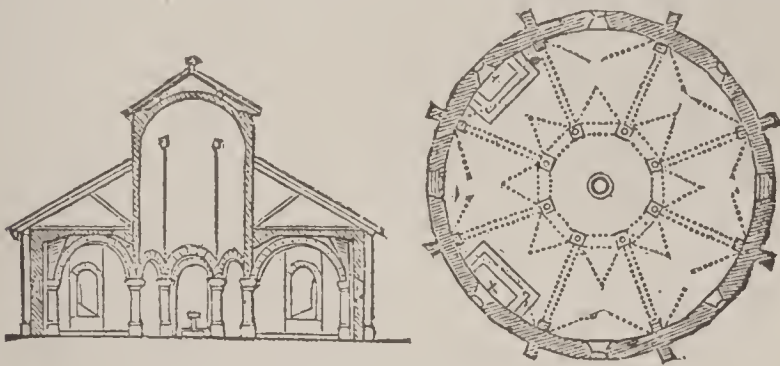
BAPTIST CHURCH OF CHRIST: sect organized in Tenn., 1808, where more than half its membership now exists—the remainder in six other southern states. Its creed sets forth a mild form of Calvinism, including a general atonement, the possibility of salvation for all, justification by faith, perseverance, baptism for believers only, immersion, and foot-washing. Number of organizations (reports for 1902), 152; number of members, 8,254; value of church property, \$56,755.

BAPTISTE, bâp-tĕst', JEAN B. BERNARD: French officer whose name merits a place in history on account of his services in the battle of Jemappes (1792, Nov. 6). He was then a simple servant of Dumouriez. The centre of the army being routed by the Austrians, he, with admirable presence of mind, delivered to the commanding officers pretended orders from his general, caused the battle to be renewed, and the cavalry to make a charge, and thus, by his bold initiative, turned the tide of the battle, whose issue after that was no longer in doubt. Unfortunately for his glory, he did not hesitate afterwards to follow his master in his treason.

BAPTISTE, JOSEPH FRANCIS: French actor. He married Marie Bourdais, a theatrical performer, of Bordeaux, and became the father of a great dramatic family.

BAPTISTERY.

BAPTISTERY [Gr. *baptisterion*, a large vase or basin] name given sometimes to a separate building, sometimes to the portion of the church itself in which the ceremony of baptism was performed. In the latter case, the B. was merely the enclosure containing the font, to be seen in most English churches. According to the earlier arrangements



Section and Plan of Baptistery at Asti.

of the Christian Church, however, the B. seems usually to have been a building standing detached from, though in the immediate vicinity of the church to which it appertained. Baptisteries, at first, were either hexagonal or octagonal, but afterwards became polygonal, and even circular. The B. of St. Giovanni in Fonte, at Rome, commonly known as the B. of Constantine, is octagonal, while the church of St. Constantia, which was originally a B., is circular.

The celebrated B. of Florence is an octagonal structure, about 100 ft. in diameter. It stands detached from, but near, the cathedral. It is of black and white marble, in the style which Giotto is said to have introduced, and which is still peculiar to Florence. Internally, a gallery, which runs nearly round the whole building, is supported by 16 large granite columns, and the vaulted roof is decorated with mosaics by Andrea Tafi, the pupil of Cimabue. But the magnificent bronze doors, with their beautiful bas-reliefs, are the most remarkable feature of this famous baptistery. The most celebrated of the three doors was executed by Lorenzo Ghiberti, the earliest being the work of Andrea of Pisa. Fifty years were required for their completion; and it is remarkable that the contracts for their execution are still preserved. Next in importance, and of even greater size, is the B. of Pisa. It is circular in form, with a diameter of 116 ft. Externally, it is divided into three stories, the two lower surrounded by columns, of which the upper are smaller and more numerous than the under. The building is raised from the ground on three steps, and terminates in a pear-shaped dome, famous for its echo, the sides acting as whispering-galleries. The largest B. ever erected is supposed to have been that of St. Sophia, at Constantinople, which was so spacious as to have served on one occasion for the residence of the emperor Basilicus.

BAPTISTS.

BAPTISTS (sometimes called *Antipædobaptists*, as opposed to *Pædobaptists*, or those who advocate Infant Baptism*): a denomination of Christians holding that baptism is immersion, and that it can rightly be administered only to those who profess personal faith in Christ. They refuse to acknowledge any great name as founder of their sect. They trace their origin to the primitive church itself, and refer to the Acts of the Apostles and their Epistles as affording, in their opinion, incontestable evidence that their leading tenets have the sanction of inspiration.

The particular tenet which characterizes B. among their fellow-Christians is, that baptism is an ordinance the validity of which depends on an intelligent faith on the part of the recipient. Their views on this question may be reduced to two heads—the *subjects* and *mode* of baptism. The subjects of the baptismal rite they hold to be believers in the Lord Jesus Christ. They ground their faith in this matter on the following positions—namely: 1st, The Lord in his commission to his apostles associates teaching with baptism, and *limits* the administration of the rite to *the taught*. 2d, The Acts of the Apostles shows how they understood their Master, for they baptized none but believers, or such as appeared to be so. 3d, That the kingdom of Christ as it appears in this world is restricted to credibly converted persons, as is shown in his discourse with Nicodemus: ‘Except a man be born again, he cannot see the kingdom of God;’ and his subsequent statements on to the hour when he uttered his memorable confession before Pilate, ‘My kingdom is not of this world,’ uniformly proves that its subjects and institutes form a distinct and separate community from the Jewish theocracy, which embraced in one commonwealth parents and children in nonage. 4th, They maintain that the ordinance, as explained in the New Testament, always points to a moral and spiritual change, apart from which it were indeed a meaningless ceremony.

As respects the *mode*, the B. hold that only immersion in water *is* baptism. They argue, that the original term *baptizo* conveys this meaning, and no other; that nothing less can possibly answer to the apostle’s explanation in Rom. vi. 4, 5, and Col. ii. 12, ‘buried with him in baptism, wherein also ye are risen with him;’ that the many allusions in the epistles to the churches manifestly bear out this interpretation; and that the fact of John baptizing at a spot selected for the purpose ‘*because there was much water there,*’ is conclusive for this interpretation.—For fuller statement of the Baptist position, see the last part of this article.

Their form of church government is purely congregational, and has developed great simplicity and strength. They maintain that the only officers are pastors (otherwise called elders and bishops), and deacons; that the number of official persons in each of the apostolic churches cannot be ascertained from the record, but must of necessity have depended—and always must depend—on circumstances; that each local church is possessed of the power of self-govern-

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ment, under its exalted head, Jesus Christ, subject to no outside tribunal or court of review; that discipline is to be exercised in the presence, and with the consent, of all the members; and that persons are to be received or excluded at the voice of the whole membership.

The B. are divided among themselves regarding communion—one portion receiving conscientious Pedobaptists to the Lord's table and membership; the other refusing this privilege to any but Baptists. The churches of the former are called open communionists; the latter, strict or close communionists. B. in England are almost all 'open communionist;' in the United States, almost all (in the regular connection) 'close communionists.'

Next to the Moravians, the B. were earliest in the field of missions. They have been honored in planting Christian churches in many parts of continental India, in Ceylon, in the Bahamas, the West Indies, Africa, and China. No mission band has arisen in any denomination, within this century, who have surpassed those sent out by the B. of Britain and America in ardent zeal, patient perseverance, and invincible fortitude. The work among the Telugus in India has had results probably unequalled in modern times. The names of Carey, Marshman, Ward, Knibb, and Judson will be held in grateful remembrance by all generations; and their footsteps are now being trod by a long list of Christian missionaries of all evangelical persuasions, who are 'the messengers of the churches and the glory of Christ.'

In the United States, the B. (Associated) are one of the most powerful and active denominations.

The official reports (1901) show:

Ordained ministers....	29,810
Churches.	43,959
Members....	4,233,226
Baptisms.....	107,235
Associations ..	1,680
Sunday-school scholars.....	1,794,820

CONTRIBUTIONS.

Salaries and expenses.....	\$10,128,298
Missions.....	1,953,078
Education.....	2,269,250
Miscellaneous.	1,000,000

Total.....	\$15,350,626
Sales of Publication Society.....	670,972

There were 662 new churches organized during the year (1896), and 504 ministers ordained; 59 ministers were received from other denominations. A net increase in total membership of 108,972 is shown over the year preceding; or above 2.9 per cent., and an increase of 13 per cent. since 1893.—The B. are distributed evenly among the different states, as no state has more than 10 per cent. of the total membership. It requires 17 states to cover 86 per cent. of the total membership.—The density of white membership runs from 1 Baptist to every $5\frac{1}{2}$ of the white population in S. C., to 1 in 120 in Wis.; Colo. has 1 in 18; N. J., 1 in 36;

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N. Eng., 1 in 36; Ind., 1 in 40; Ill., 1 in 40; Kan., 1 in 41; N. Y., 1 in 46; Mich., 1 in 60; Io., 1 in 60; O., 1 in 62; Penn., 1 in 63; Minn., 1 in 93.—The density of colored membership runs from 1 in 3 in Va., to 1 in 13 in Tenn.; Ky. has 1 in 4; Ga., 1 in 5; N. C., 1 in 5; S. C., 1 in 5; Texas 1 in 6.—B. in their various denominations in the United States, amounting to about 3,500,000, comprise one-twentieth of the total population.

The average of contributions of the B. (Assoc.) (1893) for all purposes was \$6.29 per white member and 31 cents per colored. Average for missions, 55 cents per white and 1½ cents per colored member.

The Baptists of the United States employ (1896), under their different missionary societies, 535 missionaries with 1,754 ass'ts in foreign and 1,147 in home work.

The Baptist educational institutions comprise 7 theological seminaries, with a total of 70 instructors and 1,069 students; 36 universities and colleges, with 845 instructors and 11,287 students; 29 female seminaries, with 386 instructors and 3,444 students; 64 male and female seminaries and academies, with 518 instructors and 11,676 students; and 33 institutions for the colored race and Indians, with 280 instructors and 4,931 students; making a grand total of 169 institutions, with 2,099 instructors, 39,692 students, 864,435 volumes in libraries, endowments of \$18,417,152, and a valuation of \$16,297,503 for grounds and buildings. These establishments have cost more than \$36,240,000.

There are 33 charitable institutions, with property worth in the aggregate \$1,525,721.

The periodical literature consists of 64 weekly and 56 semi-monthly, monthly, and quarterly publications. The total number of publications of every kind issued by the Baptist Publication Soc., Philadelphia, during the year (1896) was 38,230,200 copies.

For the *United Kingdom*, returns for 1895 gave 2,803 organized churches, 3,809 chapels, 1,225,097 sittings, 1,935 pastors, 4,155 local preachers, 353,967 church members (besides 30,000 non-reporting), 513,638 Sunday-school pupils, and 48,784 Sunday-school teachers.

BAPTIST STATISTICS FOR THE WORLD FOR 1901.

	Churches.	Ministers.	Members.
America.....	30,601	45,329	4,376,566
Europe.....	3,118	4,069	488,869
Asia	852	1,602	119,745
Africa	129	111	6,700
Australasia	169	236	19,261
Total.....	34,869	51,347	5,212,880

The following—prepared by an eminent Baptist preacher and writer—presents the position of the (regular) Baptist churches.

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BAPTISTS, in their general faith, hold the principles commonly known as Calvinistic; though usually in a somewhat modified form; but in addition to this they declare that the Bible contains Christ's will in all that relates to Christian faith and practice, whether in doctrine, ordinance, the leading of a holy life, or in administering church government. This they have never supplemented with any decree, standard of faith, or authoritative creed for subscription. They believe that a Christian church must be composed only of persons spiritually regenerated. With them, the church is not a mere voluntary association, but it is a body called out of the world around, by the Holy Spirit, to be a people peculiar to Christ. They maintain baptism and the Lord's Supper after the apostolic appointment; that baptism is the privilege only of believers in Christ Jesus; that it consists in a burial of the entire body in water, into the name of the Father and the Son and the Spirit; and that it is of no efficacy in regeneration of the soul, because each person must give reasonable evidence of his conversion to Christ in order to claim baptism at all. And, further, they earnestly oppose any connection of the church with the state, and all distinctions made by the state among its citizens on the ground of religion.

The great body of B. reject the doctrine of a visible succession of ministers or churches down from the apostles, as a merely human figment, clinging to the belief that the true succession from Christ and his apostles consists of a healthful descent of doctrine and practice, as vital to a true church. They say, with Zanchius, Bradford, Stillingfleet, Ridley, and Cranmer: 'Let succession know its place, and learn to vaile bonnet to the Scriptures. The succession so much pleaded by the writers of the primitive church was not a succession of persons in apostolic power, but a succession of apostolic doctrine' (*Irenicum*). The great distinctive doctrine of the B. is, and always has been, that of a purely spiritual membership, without any privileges of birthright, without an involuntary membership such as that which infant baptism may impose, and without any dictation or interference from the state. They contend that the liberties with which God has endowed a little child cannot be invaded, even by his parents, in forcing him into any church relation to which he never assented; while as to the dedication of their children to God by prayer and a holy example, and by every appliance of religious instruction, this they practice with sacred awe. Further, they hold that age has nothing to do with Christian discipleship, which is purely a matter of perception and responsibility, and that, therefore, all religious choice must be left to the child's convictions. To them, infant baptism, in some undefined and undefinable sense, puts a little child into the church of Christ, and then leaves him outside the discipline and the ordinances of the church, and without its watch and its care. A Baptist believes that if his little child dies while he is irresponsible by reason of his tender years, he will be saved through the redeeming love of Christ and

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that if a baptized child dies and is saved, it will be in the same gracious manner. He also believes that if the child reaches the age of responsibility, and wishes to become a servant of Christ, he should enjoy the high and inalienable honor of assuming Christ's yoke under the dictates of sanctified reason and manhood, and that this is his indestructible prerogative.

Some of these Baptist principles were found among the early Montanists and Novatians, and all of them were conserved among the ancient Cathari (q.v.), the Petrobrusians (see HENRICIANS), and a large class of the Waldensians (see WALDENSES). They lived through centuries among the followers of Peter Birus and Henry the Deacon (q.v.); they spread all through the Swiss valleys, in n. France, Italy, Holland, and Upper and Lower Germany. Space is lacking here to meet the unjust aspersions which were cast upon the B. of Germany, Holland, Switzerland, and Moravia, or to depict their sufferings. Drs. Dermont and Ypeig, reporting the result of their investigations to the king of Holland, say: 'The Baptists, who were formerly called Anabaptists, and in latter times Mennonites, were the original Waldensians, and have long in the history of the church received the honor of that origin. On this account the B. may be considered the only Christian community which has stood since the apostles, and as a Christian society which has preserved pure the Gospel through all ages.' Dr. Keller, the librarian at Münster, and possibly a somewhat skeptical German, says: 'The more I examine the documents of that time at my command, the more am I astonished at the extent of the diffusion of Anabaptist views, *an extent of which no other investigator has had any knowledge.*' Their martyrology was enormous. Buckle says that 'in Holland and in Friesland, more than 30,000 persons have suffered death at the hands of justice, for Anabaptist errors (*Hist. Civ.*, I., p. 189). Motley put the number at nearer 50,000, and Brandt higher still. Motley also shows how the Prince of Orange was wonderfully influenced by B. in securing religious liberty for the Netherlands, through the Articles of the Union of Utrecht (*Dutch Republic*, III., pp. 206, 207, 334, 412, 413, 415). The history of B. in the Orient and on the continent of Europe, is a wonderful revelation to those who have never troubled themselves with the investigation.

We have several indications that in England and Wales Baptist principles obtained early footing. Collier says that in the middle of the 12th c. many infants were left unbaptized, despite the severity of the law. Several writers speak of a Baptist church at Chesterton as early as 1459, and Fox records the burning of 19 Anabaptists in England 1553. Several monarchs, especially James I., had driven what few of them there were out of the kingdom, and they had taken refuge chiefly in Holland. The first church which we find in England after his day is one organized in London 1612-14, of members who had returned from Amsterdam; and from that time their history in England is clear

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and traceable. They flourished remarkably through the period of the Commonwealth under Cromwell, stout upholder of religious liberty. After the Restoration, they suffered severe persecution, though not nearly so severe as under Henry VIII., Mary, and Elizabeth. Many ministers of state and officers of the army and navy under Cromwell were B., but afterward, until the time of William III., many of the B. suffered with John Bunyan in prison. Since that time they have had rest, have prospered, and produced some of the finest scholars and preachers in Great Britain, among whom may be named Charles Spurgeon and Dr. Joseph Angus, for more than 40 years pres. of Regents' Park College, London. Henry Havelock, the great Indian general, and the late Chief-Justice Lush were devoted members in the Baptist ranks.

The most noted chapter in Bapt. history is found in their marvellous growth in America. So far as is now known, Roger Williams founded the first Bapt. church in the new world. Williams was a clergyman of the Church of England, but was driven out of that country by the persecutions of Abp. Laud. He landed at Boston, Mass., 1631, and settled at Salem, where he soon rejected the union between the church and the state, and was banished from the colony. After wandering long in the wilderness, he founded the state of Rhode Island, and established a Bapt. church of 12 members at Providence. From this planting, the great body of American B. has sprung, now numbering in the United States 36,622 churches, 24,104 ministers, and 3,160,653 members. Williams laid the divine right of religious freedom as the cornerstone of his commonwealth, declaring that all concerns of the soul were matters between man and his Maker, and that the state had no right to prescribe religion to any citizen—no right to punish him for following this religion or that, but that he was entitled to 'soul liberty' as freely as to the air which he breathed. This doctrine alarmed most of the American colonies, especially those of New England, N. Y., Va., and Ga., all of which except N. Y. had established religion by law. In N. Y., the B. were proscribed and driven from the colony; and in New England, Va., and Ga., they were heartlessly whipped, fined, and imprisoned.

A long and fiery struggle ensued between the B. and the govts. of these colonies, which continued throughout the war of the revolution and the forming of the United States as a nation. When American independence was secured, the new constitution provided (Art. VI.) that congress should not impose 'religious tests on those who held office or public trusts under the United States,' but left it at liberty to impose such tests in other cases. This alarmed the B., who to a man had supported the revolution; and they called a convention to take resolute action in the case. This body met in Richmond, Va., 1789, Aug. 8, and sent a powerful protest and petition to Pres. Washington, asking his aid in securing religious rights. He thanked them for their patriotism; and Madison, with his approval, moved in congress that the constitution be so amended as to read: 'Congress

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shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof.' This change was adopted by the states and is now a part of Art. I. No Baptist has since been persecuted in the United States; but the contest long went on in Mass., and not till 1832 were the B. in that state freed from unjust laws. In religious matters they scout all toleration as a usurpation which no man may assume, and demand 'soul liberty' as a natural right, given of God to men.

The English B. established their foreign mission soc. 1792, and the American B. organized theirs 1814. Both have had astonishing success. Both have just celebrated the centennial of the English soc., founded by William Carey, and during 1892 the British soc. raised a special fund of £110,000, while the American has made its annual contribution for mission work more than \$1,000,000. At present there are in all lands between 4,000,000 and 5,000,000 immersed believers, known by one designation or another as B., besides the 71,000,000 communicants in the Greek Church, which at least holds to immersion in water. In the United States the B. have educational institutions established at a cost of more than \$30,000,000.

BAPTISTS, ANTI-MISSION: see BAPTISTS, PRIMITIVE.

BAPTISTS, CAMPBELLITE: see DISCIPLES OF CHRIST.

BAPTISTS, FREE: sect which originated 1779 through a discussion among the Baptists in New Hampshire concerning the doctrines of Calvin. The founder of the body was Benjamin Randall, an uneducated man, but who possessed solid sense and deep piety. He was converted at New-castle, N. H., when twenty-two years of age, through the preaching of the celebrated George Whitefield, and about four years afterwards, 1776, he united with the Calvinistic Baptist Church in Berwick. His difference with the regular sect occurred through his preaching a general atonement and the ability of sinners to accept Christ. After the new church was formed they desired to be known simply as Baptists, but they were called 'Free Willers,' and the denomination eventually united both names, terming themselves 'Free Will Baptists.' The causes leading to this association were two, the first being found in the Arminian tendencies which existed to some extent among the early Baptist churches. Generally these churches were Calvinistic, yet there were members and some ministers who, having belonged in England to that division of the body called 'General,' and having always been moderate Calvinists, and some of them Arminians, brought those views with them to this country, and sought to propagate them in the churches here. This course naturally awakened opposition, and indeed occasioned the separation. A second cause is found in the Antinomianism which spread to a considerable extent about that time, and which a quarter of a century later caused the secession of the old-school Baptists.

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Randall had been instrumental in the extension and revival of religion in Dover, N. H., the place of his birth, and also in other places, and on imbibing Arminian notions he dissented from the body with which he had connected himself. The Baptist church in Berwick met and considered his case, and withdrew fellowship from him.

There was not an ecclesiastical organization in America to which Randall and his followers could naturally ally themselves. On the special mode of baptism they were Baptists, but Baptists were Calvinists, while they were Arminians. Their first church was formed at New Durham, N. H., in 1780. Like all new sects, terms of reproach were used towards them. Besides the appellation by which they have since become recognized, they were called 'Randallites,' 'General Provisioners,' and 'New Lights.' The first quarterly meeting was organized among them in 1784, and the first yearly meeting of delegates from the quarterly meeting, in 1792. The general conference was formed in 1827; it now meets triennially. In the mean time there had arisen in Rhode Island and Connecticut a sect known as the 'Free Communion' B., a denomination which also owed its origin to Whitefield's preaching, and in 1841 this body united with the Free B. Different questions came up at the conferences for discussion, perhaps the most important of which was at the fifth conference, 1851, the subject of foot-washing as a religious ordinance, when the churches were given liberty to retain or give up the ordinance, as might be preferred. Many of them took this liberty and gave it up. This body has always held anti-slavery views, and it is a matter of history that, some years before the civil war, fellowship was withdrawn from 4,000 of its members in the state of North Carolina, on account of their being slaveholders. It is also related that 12,000 members in Kentucky, who sent delegates to the general conference, were for the same reason refused admission. The Free B. are a unit with the general body on the subject of baptism and in congregational church government, but they do not accept the doctrine of Calvinism. See BAPTISTS, GENERAL.

The Free B. deny personal unconditional election to eternal life in Christ as a consequence of an eternal decree; hence they have repudiated the doctrine of final perseverance, as explained in harmony with the Calvinistic theory, and hold that election is made sure by perseverance only. They also differ on the subject of communion, practicing what is known as 'open communion,' and not, like the regular B., regarding immersion as essential to the communion at the Lord's Table. In fact they do not insist on baptism as an indispensable scriptural pre-requisite to the Lord's Table. In this they differ from many others as much as from the great body of their Baptist brethren.

Prior to the war of secession, on account of their strong anti-slavery opinions, the Free B. had no churches in the South. Now, however, they have missionaries at various points, and a school for colored students at Harper's Ferry.

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W. Va., Storer College. Their early ministers were men who lacked thorough collegiate training, having to depend for their education upon the ordinary facilities afforded by the New England common schools of the time. Now the denomination sustains 13 institutions of academic and collegiate grade, including Bates College, Lewiston, Me., with the Cobb Divinity School; and Hillsdale College, Hillsdale, Mich., with a theological department. Reports for 1896 showed 1,540 churches; 1,362 ordained ministers; 175 students studying for the ministry; 212 licensed preachers; 85,504 members, (over one-third confined to New England); total contributions for missions and education, \$84,082; value of church property, \$2,661,409. The publishing house is at Boston, Mass., and the leading church paper the *Morning Star*.

BAPTISTS, GENERAL: sect so called because they differed from the Particular or Regular Baptists in holding that Christ made general atonement for the entire race, and not merely in particular for those effectually called. The sect is Arminian in theology. They appeared in England early in the 17th c. At the beginning of the 18th c. the General B. in New England associated themselves in a yearly meeting. Churches having this belief were organized during the first half of that century in Md., Va., N. C., and S. C. Most of these subsequently joined the Calvinistic B. The first association in the west, where the denomination now has its entire strength, was effected in Ky. 1824. In 1830 the practice of open communion was adopted. In 1845 an article of belief was changed so as to indicate the salvation of infants and idiots; and another to read, 'He that shall endure unto the end, the same shall be saved,' instead of, 'The saints will finally persevere through grace to 'glory.' A general association was formed 1870. The dominating spirit is anti-Calvinistic, and the body is increasing. They are substantially in accord with the Free Baptists (q.v.) The denominational name General Baptists now applies to only a fraction of the body of Bapt. believers in a general atonement. Another and smaller fraction is known by the name *Six-Principle Baptists* (q.v.).—Number of churches (reports for 1902) 423; members 24,775; church property \$201,140.

BAPTISTS, GERMAN: see TUNKERS.

BAPTISTS, OLD-TWO-SEED-IN-THE-SPIRIT PREDESTINARIAN: sect representing an extreme conservative Bapt. element, and found mostly in the s.w. states. 'Two-seed' indicates their belief in a seed of life and a seed of death; one appeared in man when he fell from his native holiness and brings forth death, the other is implanted by the Holy Spirit and springs up unto eternal life. Their creed embraces election, effectual calling, and perseverance; asserts that the church is a spiritual kingdom; enjoins foot-washing; declares that the punishment of the wicked will be eternal.—Number of churches (reports for 1902) 473; members 12,851; church property \$135,230.

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BAPTISTS, ORIGINAL FREEWILL: sect beginning in N. C., in the first half of the 18th c. Many of the early churches became Regular Bapt. churches. Those declining to unite with the Calvinistic associations came to be called 'Freewillers,' because of their doctrine of freedom of the will. Their distinguishing beliefs are that Christ freely gave himself for all; that God desires that all men shall repent; that all men may be eternally saved; that the ungodly are ordained to condemnation; that children dying in infancy are saved; that only believers should be baptized; and that the only baptism is immersion. They believe also in washing the saints' feet, and in anointing the sick with oil. Their operations are confined to the two Carolinas.—Number of churches (reports for 1902) 167; members 12,000; church property \$57,005. See BAPTISTS, FREE.

BAPTISTS, PRIMITIVE (called also **OLD-SCHOOL**, or **REGULAR**, or **ANTI-MISSION**): sect named from their positive objection to human effort in religious affairs as derogating from the divine glory. Hence they oppose the establishment of Sunday schools, missions, bible-and educational societies, and other organizations, which they regard as unwarranted and unnecessary. The Chemung (N. Y.) assoc. took the initiative steps to formal separation 1835. The Baltimore (Md.) assoc. followed 1836, and the Warwick (N. Y.) assoc. 1840. A separation gradually took place. The articles of faith represent an extreme Calvinism: they comprise total depravity, election, reprobation, justification by faith and perseverance; they declare that the Lord's Supper and the washing of saints' feet are ordinances of the Gospel; that religious societies other than the church are human inventions and, that it is wrong to join them; and they require immersion of believers. The denomination is represented in 24 states and the Dist. of Columbia. In northern states it is strong only in Ill. and Ind. —Number of churches (reports for 1902) 3,530; members, 126,000; church property \$1,394,883.

BAPTISTS, SEPARATE: sect which favored the White-field revival and separated from those who opposed it. Most of the original 'Separates' in various parts of the country long ago united with the regular Baptists (see **SEPARATES**). The sect now so named are in doctrinal agreement with the Free Baptists, holding to a general atonement, and rejecting the doctrine of election and reprobation. Number of churches—all in Indiana—(reports for 1902) 103; of members 6,479; church property, \$9,200.

BAPTISTS, SEVENTH-DAY: sect differing from the regular Baptists in a single point only, being distinguished from that body and from nearly all other Christians, in continuing the observance of the Jewish Sabbath, the seventh day instead of the first day of the week. Their claim is that the Christian churches before the time of Constantine did not observe the first day as the Sabbath. Late in the 15th c. 'Seventh Day Keepers' appeared in Germany. In England soon after the Reformation they organized as a separate denomination,

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bearing the name of 'Sabbatarians,' and eleven of their churches existed at the close of that century, of which only three remain. They appeared in this country in 1665, and about 1671 organized a church at Newport, R. I. Other churches were soon organized in that state, and in New York and New Jersey, several of which still exist. They began the establishment of yearly meetings with the 18th c., and their general conferences with the 19th c.—at first held only annually, now triennially. The name 'Seventh Day Baptists' instead of 'Sabbatarians' was adopted 1818. In 1845 they were in five associations, Ohio, Virginia, Eastern, Central, and Western. They are generally described as a people of ardent piety and great devotion. They favor total abstinence, and are generally reformatory in their methods. They have a publication society for printing and circulating tracts and books, and they support missionaries in Palestine and in China. The general conference held in 1878 had representatives by letter from 55 churches. In 1893 there were reported 8,450 members; 65 Sunday schools, with 729 officers and teachers and 5,100 pupils; 3 educational institutions (Salem College, Va., Milton College, Wis., and Alfred Univ., N. Y.); tract soc.; missionary soc., with foreign stations in China, Holland, and Austria; and a woman's co-operating board.

BAPTISTS, SIX-PRINCIPLE: small body of Baptist churches, holding Arminian views and believing in a general atonement; basing their faith on the six principles laid down by the apostle Paul, Hebrews, vi. 1, 2 viz., repentance, faith, baptism, laying on of hands, the resurrection, and the eternal judgment. As a rule their ministers are poorly educated and their churches lightly supported. Formerly they had some influence in Rhode Island, and their denomination is confined to that state, Massachusetts, New York, and Pennsylvania. In 1845 they had 19 churches, 14 ministers, and 3,000 members. Since then they have been gradually declining, and the last of their reports accessible, that of 1902, gives them a membership of 828, with 8 ministers and 12 organized churches.

BAPTISTS, UNITED: sect originating about the middle of the 18th c. in a separation—during the great revival movement in America led by George Whitefield—between those who favored and those who opposed the movement. The seceders were called Separates (q.v.), and those whom they left Regulars. After a time, some members of these factions came together, taking the name of United Baptists. The basis of union was nearly Calvinistic. Their articles of belief assert that Christ died to make atonement for sin; that sinners freely choose their condition; that God has elected a great multitude among all nations; that saints will persevere to the end; that baptism should be administered to believers only, and by immersion; and that foot-washing ought to be practiced by all baptized believers. This sect is found mostly in the southwestern states. Number of churches (reports for 1902) 204; members, 13,209; church property, \$55,350.

BAPTIST YOUNG PEOPLE'S UNION—BAR.

BAPTIST YOUNG PEOPLE'S UNION OF AMERICA: fraternal union of all young people's organizations in the Bapt. churches; organized 1891, July 8. Of these, bearing a diversity of names, the earliest began about 1859. With the rise of the Christian Endeavor (q.v.) movement, many of them became societies of Christian Endeavor, while many new societies were organized according to the Endeavor plans. In 1886-7 the 'Loyalist movement' was begun to prevent the further spread of Christian Endeavor societies in Bapt. churches by encouraging instead a strictly denominational organization. Serious division was threatened; and a conference of leaders met at Philadelphia 1891, Apr. 22, which found basis of agreement and brought harmony of plans, pursuant to which a Baptist young people's convention of 2,900 enrolled delegates at Chicago organized the B. Y. P. U. At this time there were by common estimate about 2,500 Bapt. Christian Endeavor societies, about the same number of Bapt. societies under various titles unidentified with the denominational movement, and about the same number strictly denominational.

The new Union found great favor and has had remarkable success: nearly every northern state has a state B. Y. P. U. It is growing rapidly in the southern states; and Canada is organized under two great Unions. The 6th international convention, Milwaukee, July 16-19, was attended by 8,000 enrolled delegates and 40 states and Canadian provinces were represented. No local name or constitution is enforced: Bapt. young people are simply urged to organize according to such methods as their own churches shall approve, and when so organized, to join these denominational Unions. The object is set forth in the common constitution, which, with little variation, all have adopted—'The unification of Baptist young people; their increased spirituality; their stimulation in Christian service; their edification in Christian knowledge; their instruction in Baptist history and doctrine; and their enlistment in Christian activity through existing denominational organizations.'—The Union is not executive but educational: it does not send out missionaries nor endow schools; but seeks to extend the knowledge of missions, to arouse interest in Bapt. schools, and to spread Bapt. literature among Bapt. young people. It is the only international organization of Baptists. It publishes a weekly religious paper, the *Young People's Union*, from its headquarters in Chicago. This is one of the most widely circulated Bapt. papers in the world.—It is estimated that there are (1896) about 8,000 Young People's Societies with 400,000 members in the local organizations, including about 1,500 Junior societies, with about 40,000 members. The Union is governed by a board of managers representing all the states and provinces enlisted in the work. An executive committee at Chicago has immediate charge.

BAR, n. *bâr* [Fr. *barre*; It. and Mid. L. *barra*, a cudgel, a bolt: Celt. *barr*, the top, a high place; *barra*, a court of justice: AS. *beorgan*, to shut in, to shelter: W. *bar*; Gael.

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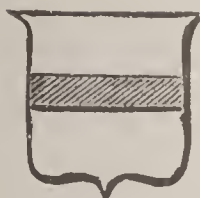
barra, a bar, a spike]: a high inclosure; a bolt; a long piece or rod of any solid substance of small diameter which obstructs entrance, as the bar of the house of commons; an inclosed place at an inn where liquors are sold; the inclosed or fixed place in a court of justice where barristers plead, and where criminals on trial are placed; a division in music, or the line that makes the division; a sandbank at the entrance to a river or harbor; the body of lawyers that plead; any hindrance; a stop: V. to secure; to fasten; to hinder; to shut out; to restrain. BAR'RING, imp. BARRED, pp. *bârd*. BARRY, a. *bâr'ri*, in *her.*, applied to an escutcheon having bars or divisions across from side to side. BAR'LESS, a. BAR'WISE, ad. *-wîz*. BARRICADE, n. *bâr'ri-kād'* [Sp. *barricada*, Gael. *barrach*, heaped up, branches, brushwood: F. *barrer*, to stop the way]: an obstruction hastily thrown up; an impediment; a defense: V. to fasten; to fortify; to secure. BAR RICA'DING, imp. BAR'RICA'DED, pp. BAR'RICA'DER, n. GAE who. BARRIER, n. *bâr'ri-ér* [F. *barrière*—from F. *barre* a bar]: a boundary; a limit; defense; line of separation. BARRISTER, n. *bâr'ris-tér* [mid. L. *barristarius*]: one who pleads at the bar in a court of law; an advocate. BAR'SHOT, n. doubled shot joined by a bar, used for destroying masts and rigging in a naval engagement. BAR'-IRON, a long thick rod of malleable iron prepared from pig-iron for the use of blacksmiths. BAR-FRAME, n. the frame which supports the metallic bars of a furnace. BAR'-LOOM, n. a loom for weaving ribbons. BAR-SHOE, n. a horseshoe having a bar across the open part of the heel, to protect the frog of the foot from injury. BAR'MAID, n. a woman who attends at the bar of a tavern, etc. BAR SINISTER, *sin'is-tér* [L. *sinister*, on the left hand or side]: in *her.*, a mark of bastardy denoted by a bar on the left-hand side of the escutcheon, called the *bastard-bar*. See BEND. TRIAL AT BAR, before the judges of a particular court, who sit together forth at purpose *in banc* (q.v.). See BAR OF DOWER: PLEA: PLEADING: TRIAL AT BAR: TOLL: FELONY: TREASON: BARRISTER: ADVOCATE: ATTORNEY.

BAR: any elongated piece of wood, metal or other solid substance. In the iron manufacture, B. is a rod, either round or square shafted. Round bars are made by drawing the iron red-hot through a bore or hole in a plate, square bars by passing it, likewise red-hot, through a roller mill between two rollers counter-grooved, with their triangular-grooved faces forming the square opening for the passage of the iron. Railway and knee iron are made in the same manner. See IRON.

BAR, or BARR, in Heraldry: one of those more important figures or charges in heraldry which are known as *ordinaries*. By the heralds of Britain, the ordinaries, or as, by way of eminence, they are called, the ‘honorable ordinaries,’ are commonly reckoned as ten in number, the sub-ordinaries, or minor charges, being greatly more numerous. The B., like the Fess (q.v.), is formed by two horizontal lines passing over the shield, but it differs from it in size, the fess occupying a third, the B. only a fifth

BAR—BARAGUAY D'HILLIERS.

part of the shield. There is this further difference between these two ordinaries, that the fess is confined to the centre, while the B. may be borne in several parts of the shield. There is a diminutive of the B. called the Closet, which is half a B.; and again of the closet, called the Barrulet, which is half a closet, or the fourth part of a bar.—BAR-GEMEL is a double bar, from the French *jumeau*, f. *jumelle*, a twin.



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BAR, in Hydrography: a bank opposite the mouth of a river, which obstructs or *bars* the entrance of vessels. The B. is formed where the rush of the stream is arrested by the water of the sea, as the mud and sand suspended in the river-water are thus allowed to be deposited. It is thus that deltas are formed at the mouths of rivers. The navigation of many streams (as the Danube) is kept open only by constant dredging or other artificial means.

BAR, in Music: a line drawn across the staff, to divide the music into small portions of equal duration; each of these small portions is itself also called a *bar*.

BAR, PLEAS IN: see PLEADING: PLEA.

BAR, TOLL: see TOLL.

BAR, TRIAL AT: see TRIAL AT BAR.

BARABA, *bâ-râ-bâ'*: a steppe of Siberia, between the rivers Obe and Irtysh; occupying more than 100,000 sq. m. and covered with salt lakes and marshes. It was colonized by the Russians, 1767, who have since cultivated parts of it.

BARACOA, *bâ-râ-ko'â'*: seaport town on the n.e. coast of Cuba, belonging to the Spaniards; lat. 20° 22' n., long. 74° 30' w. In its vicinity is a remarkable mountain called the Anvil of Baracoa.

BARADA: see BARRADA.

BARAGUAY D'HILLIERS, *bâ-râ-gâ' dël-yâ'*, ACHILLE: French general: 1795, Sep. 6—1878, June 6; b. Paris; son of Louis. He rose rapidly through the inferior military grades, and became governor, 1832, in the military school of St. Cyr, where he suppressed a republican conspiracy. After he had served in more than one campaign in Algeria, he was promoted to the rank of lieut.gen., 1843, Aug. 6; and in 1847, he was made inspector-general of infantry. After the revolution of 1848, Feb., he was chosen a member of the national assembly, in which he joined the party of reaction, and was in favor of the restriction of the press. In 1849, Nov., he went to Rome, as commander-in-chief of the French army sent to sustain the authority of the pope. He returned, 1850; and obtained, 1851, Jan., the command of the army of Paris, in the place of Changarnier. B. concurred in the policy of the *coup d'état* of 1851, Dec., and was made a member of the Consultative Commission. During the Crimean war, he received the command of the French expeditionary corps of the Baltic, and co-operated with the British fleet in the

BARAGUAY D'HILLIERS—BARBACENA.

capture of Bomarsund. He was afterwards made a marshal of France, and commanded in the Italian war of 1859. In 1871 he was made president of the court appointed to investigate the conduct of the generals who surrendered fortresses during the Franco-Prussian war.

BARAGUAY D'HILLIERS, Louis: a distinguished general of the French empire: b. Paris, 1764; d. Berlin. After serving under Custine and Menou, he received from Napoleon an appointment in the army of Italy, and was a sharer in all the success of the campaigns of 1796, 7. He was made a general of division; and in virtue of Napoleon's treaty with the Venetian Republic, 1797, May 16, commandant of Venice. B. accompanied the expedition to Egypt; afterwards successively held appointments in the armies of the Rhine, and the Tyrol, and in Catalonia. He headed a division in the Russian campaign of 1812; but on the retreat he incurred the displeasure of Napoleon. He was sent as governor to Berlin, where he soon after died of grief and exhaustion.

BARALIPTON, n. *bār-a-lip'tōn* [a word composed of symbolical letters, *A* representing a universal affirmative; *I*, a particular affirmative, and *ton* being used for euphony]: in *logic*, the first indirect Mode of the first Figure of Syllogisms. A syllogism in B. is one in which the first two propositions are universal affirmatives, and the third a particular affirmative; the middle term being the subject of the first and the attribute of the second. The following is an example of B.: BA. Every evil ought to be feared. RA. Every violent passion is an evil. LIP. Therefore, something that ought to be feared is a violent passion.

BAR'AS KHOTUN', or **BARS KHOTAN'**: ruined city on the banks of the Kherlon, one of the head-streams of the Amur, in the Mongol country. Some suppose it to have been built by the Emperor Kublai; others by Toghon Timur, 14th c., after the expulsion of the Mongols from China. The remains of the mud-walls show a city 5 m. in circumference.

BARB, n. *bārb* [F. *barbe*—from L. *barba*, a beard]: a beard, or that which resembles it; the sharp shoulders of an arrow-head or of a hook to prevent its being easily drawn back again: V. to furnish with barbs. **BARB'ING**, imp. **BARBED**, pp. *bārbd*, furnished with barbs; bearded; armed. **BAR'BER**, n. [F. *barbier*]: one who shaves beards. **BARBER-SURGEON**, a barber who also performed the smaller operations of surgery, as bloodletting; an inferior surgeon.

BARB, n. *bārb* [Dut. *paard*, a horse]: a noble breed of horses cultivated by the Moors of Barbary, and introduced by them into Spain; less remarkable for beauty and symmetry, than for speed, endurance, abstinence, and gentle temper. **BARBED**, a. *bārbd*, accoutered, said of a horse.

BAR'BACAN: see **BARBICAN**.

BARBACENA, *bār-bā-sū'nā*: a city of Brazil, in the province of Minas Geraes, 150 m. n.w. from Rio de Janeiro. It is situated on the top of two hills in the Sierra

BARBADOES.

Mantiqueira, and at an elevation of about 3,500 feet above the sea, so that, although within the tropics, it enjoys a mild climate. The streets are broad and straight, the principal ones paved and provided with footpaths. The houses are low, and have gardens behind. The inhabitants are chiefly engaged in gold-mining and in exporting coffee and cotton to Rio de Janeiro. B. is the centre of a productive district, the pop. of which is 12,000.

BARBADOES, *bár-bā'doz*: most easterly of the Caribbees: residence of the gov.gen. of the British Windward Islands. See ANTILLES. The lat. and long. of its cap., Bridgetown, are $13^{\circ} 4'$ n., and $59^{\circ} 37'$ w. Its area is about 166 sq. m., or 106,240 acres—the remarkable proportion of 100,000 being under cultivation. Besides the capital, B. contains 3 other towns, all more or less in decay—Jamestown, Speights-town, and Oistin. B. affords no harbors, being almost encircled by coral-reefs, which here and there extend as much as 3 m. to seaward. Inside of the coral-reefs, the coast, excepting at two points, presents long lines of sandy beach—one of the most remarkable being Carlisle Bay with its exposed roadstead, on which Bridgetown stands. Aside from occasional attacks of yellow fever, the climate is healthful. In 1844, the fall of rain was 72 inches; and the temperature is said to have ranged only between $76\frac{1}{4}^{\circ}$ and $83\frac{1}{2}^{\circ}$ F. Shocks of earthquake are sometimes felt, and thunder-storms are frequent and severe. But hurricanes are the grand scourge of Barbadoes. In 1780, one of them destroyed 4,326 persons, and property to the value of more than \$6,600,000; and in 1831, another destroyed 1,591 persons, and property to the value of more than \$8,000,000. Of the former of these, the violence appears to have surpassed all belief—the winds and the waves having carried a 12-pounder gun a distance of 140 yards.

Since 1834, date of the commencement of the apprenticeship under the imperial act of emancipation, the population, trade, and revenue, and general prosperity, have largely increased. Between 1833 and 1902, the revenue had increased from \$104,875 to \$899,860; the imports, from \$2,408,050 to more than \$5,100,000; the exports, from \$2,041,815, to above \$4,750,000 (sugar, \$2,400,000); tonnage entered and cleared annually, over 1,000,000 tons. Being universally cultivated in regular plantations, the island affords no room for the 'squatting' of negroes on unreclaimed lands, as in Jamaica and other West India possessions. On this account, if from no other cause, the negro population have been compelled to labor diligently for hire, and are generally in a condition most creditable to their industry and prudence, contrasting favorably with some of the lower classes among the whites. Altogether, however, the Barbadians are a shrewd and clever people. B. is the see of a bishop. It contains also many well-endowed seminaries—Codrington College, in particular, having a revenue of \$15,000 a year. B. was first colonized by the English, 1625, having previously been depopulated by the Spaniards. The peace of B. was seriously dis-

BARBADOES CEDAR—BARBADOES TAR.

turbed in 1876, by riots occasioned by the proposed confederation of the Windward Islands, in which several lives were lost, and great damage done to property. Pop. 1884 (date of emancipation), 102,231; (1901) 195,588; average 1,092 to a sq. mile. Cap. Bridgetown; pop. over 25,000.

BARBADOES CEDAR, n.: name of a cedar or juniper, *juniperus barbadensis*, a native of Florida and other warm parts of America.

BARBADOES CHER'RY: name in the West Indies for the fruit of two small trees, *Malpighia urens* and *M. glabra*, which are cultivated for its sake. Clusters of fruit are produced from the axils of the leaves. The fruit of *M. urens* is small, that of *M. glabra* is like a Mayduke cherry in size and appearance, but inferior in flavor. Each fruit contains three triangular seeds. The leaves of *M. urens* have stinging hairs on the under side. See MALPIGHIACEÆ.

BARBADOES EARTH: a deposit of fossil Polycistina found in Barbadoes.

BARBADOES FLOWER-FENCE, or BARBADOES PRIDE: the *Poinciana pulcherrima*. It belongs to the Leguminous order, and the sub-order *Cæsalpinieæ*. It is a low, spiny tree with an odor like savin, a native of the tropics of both hemispheres. In Barbadoes it is used for fences.

BARBADOES GOOSE'BERRY (*Pereskia aculeata*): a pleasant West Indian fruit, produced by a plant of the nat. ord. *Cactææ* (q.v.), with a round stem, thick, flat, alternate leaves, and large, strong spines. The fruit has expectorant properties.

BARBADOES LEG: apparently identical with the *Elephantiasis of the Arabs*; a disease characterized by hypertrophy of the skin and of the subcutaneous areolar tissue. Notwithstanding its name, it may affect the arm, female breast, etc. It begins with acute febrile symptoms, and inflammation of the superficial lymphatic vessels. The part swells, and becomes uneasy from tension, the glands being especially large and hard. The skin varies in appearance, being sometimes white and shining, and in other cases of a dark color, and studded with projecting veins. The swelling is sometimes very great, and quite hard. In some parts of the body skin which would naturally weigh less than a couple of ounces is thus converted into a tumor weighing from 100 to 150 lbs. The disease is endemic in the tropics; and in cases observed in temperate climates, it always appears that the disease commenced in a hot country.

Iodine is recommended by some doctors, and well-regulated pressure by others. The leg has been amputated, in consequence of the annoyance caused by its great weight; but this should be regarded as an ultimate resource, and ligation of the femoral artery, which often causes great subsidence of the swelling, should be first tried.

BARBADOES TAR: a mineral tar of commerce found in several of the West India Islands.

BARBARA—BARBARIAN.

BARBARA, n. *bâr'ba-ra* [a word of Latin form, having no connection with *barbarous things*, but constructed in order that its letters may be used as symbols]: in *logic*, a mnemonic word, designating the first Mode of the first Figure of Syllogisms. A syllogism in B. is one of which all three propositions are universal affirmatives, the middle term being the subject of the first and the predicate of the second. Example: BAR. All men must die. BA. But these are men. RA. Therefore they must die.

BARBARA, *bâr'ba-ra*, SAINT: suffered martyrdom at Nicomedia, in Bithynia, about 236, or, according to other accounts, at Heliopolis, in Egypt, about 306; was of good birth, and well educated by her father, Dioscorus. To avoid disturbance in her studies, he had a tower built for her, where she spent her youth in the deepest solitude. While in this retirement, she was léd, through Origen, as is said, to embrace Christianity. Her father, a fanatic heathen, learning his daughter's conversion, and failing to induce her to renounce Christ, delivered her up to the governor, Martianus, to be dealt with by the law. Martianus, struck with the intelligence and beauty of the maiden, attempted first by arguments to make her relinquish Christianity, and when that failed, had recourse to exquisite tortures. At last, the blinded father offered himself to strike off his daughter's head. Scarcely was the deed done, when he was struck with lightning. Hence St. B. is to this day prayed to in storms. For the same reason, she is the patron saint of artillery, and her image was at one time frequently placed on arsenals, powder-magazines, etc. The powder-room in a French ship-of-war is to this day called Sainte-Barbe. St. B.'s day is Dec. 4.

BARBA'REA: see **CRESS**.

BARBAREL'LI, **GIORGIO**: see **GIORGIONE**.

BARBARIAN, n. *bâr'bă-rĭ-ăn* [Gr. *bar'báros*; L. *bar'bārus*, rude—a word imitative of the confused sound of voices, conveying no meaning, by repeating the syllables *bar, bar*: F. *barboter*, to mumble, to mutter]: *originally*, one who utters a confused jargon of unintelligible sounds; a rude, savage man; an uncivilized man; a foreigner: **ADJ.** belonging to a savage; uncivilized. **BARBARIC**, a. *bâr-băr'ĭk*, pertaining to semi-civilized or uncivilized nations. **BARBARISM**, n. *bâr'bă-rĭzm*, an impropriety of speech; an uncivilized state; rudeness of manners. **BARBARITY**, n. *bâr-băr'ĭ-tĭ*, extreme rudeness; cruelty, like a savage; inhumanity. **BARBARIZE**, v. *bâr'bă-rĭz*, to make barbarous. **BAR'BARI'ZING**, imp.: **ADJ.** having a tendency to render barbarous. **BAR'BARIZED**. pp. *-rĭzĕd*. **BARBAROUS**, a. *bâr'bă-rūs*, uncivilized; savage; ignorant; cruel. **BAR'BAROUSLY**, ad. *-lĭ*. **BAR'BAROUSNESS**, n. the state or quality of being barbarous.—**SYN.** of 'barbarous': inhuman; cruel; brutal; savage; uncivilized; unlettered; uncultivated; untutored; ignorant; ferocious.

BARBA'RIAN: among the Greeks, as early as the time of Homer, signified one who could not speak the Greek

BARBARIAN.

language; and this restricted signification was not wholly obsolete even in the age of Plato, for the latter divides the entire human race into *Hellenes* and *Barbaroi*. The origin of the word is unknown, if it be not artificially formed, on the principle of imitation, to represent a meaningless babble of sound, such as the Greeks conceived all foreign languages to be. It first began to acquire its secondary and invidious signification at the period of the Persian wars. The Greeks, who had always a proud consciousness of their superior intellect and privileges, employed the term to designate the character of their enemies. It then meant whatever was opposed to Greek civilization, freedom, or intelligence: but it could not yet have attained the degraded sense in which it is now used, for the Romans in the time of Plautus accepted the appellation, and called themselves *Barbaroi*. Subsequently, when Rome, under Augustus, became the mistress of the world, the word was applied to all the Germanic and Scythian tribes with whom she came into contact. In modern times, B. signifies savage, uncivilized, or ignorant.

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